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VETERINARY MEDICINE

NOVEMBER CONTENTS 1947

Veterinary Progress, Policies and Comments

Damaged Soybeans Are Good Feed, 396; Growth Limited by Protein in Ration, 396; New High Record for Purebred Livestock Importations, 396; Pork That Is Wasted, 396; Scientists Study Foot-and-Mouth Disease, 397; Human Cases of Foot-and-Mouth Disease, 397; Vincente Ferriols, New Director of Philippine Bureau of Animal Industry, 398; Korean Veterinarian in Training in the United States, 398; Eichhorn Looks Back Over 50 Years, 399; Infectious Tumors, 399; Research to Increase Milk Production, 399; New Virus Diseases, 400; Avian Pneumoencephalitis Order, 400; Veterinarians in Foot-and-Mouth Disease Eradication in Mexico, 400; veterinary Health Division in Kansas, 400; Easy Money from Druggists, 401; Cost of Disease among Farm Animals, 401; Appointments to the Faculty of the Illinois College of Veterinary Medicine, 410; Tick Borne Diseases, 412; Anthrax, 412; Horse Meat Industry, 419.

The Cincinnati Meeting of the A. V. M. A. (continued from last month) 402

Veterinary Problems of the Fur Ranch 409

New Developments in Respiratory Diseases 411

Veterinary Problems in Poultry Production 413

Acariasis and Its Treatment 414

Equine Infectious Anemia in New England 418

Swine Erysipelas 420

Animal Welfare in the War—and After 422

Lead Arsenate for the Removal of Bots 425

Veterinary Practice XI 426

Clinical Reports 427-433

Nephritis Due to Escherichia Coli Infection, 427; Carcinoma in the Vulva of a Cow, 427; Belladonna Poisoning in Pigs, 428; Testicular Tumors in a Fox Terrier, 429; Fibrous Occlusion of the Cervix in a Sow, 430; Lymphocytoma in a Dog, 431; Amputation of the Forelimb of a Dog, 432; Poor Vaccination Causes Mink Losses, 433; Feminizing Testicular Tumor, 433.

Abstracts 434-435

Use of Penicillin in Leptospirosis, 434; Fertility of Spermatozoa Indicated by Motility, 434; Control of Coccidiosis in Chicks, 434; Cause of Equine Infectious Abortion Questioned, 435; Toxicity of Sulfonamides for Chicks, 435.

Book Review—Artificial Insemination of Domestic Animals 436

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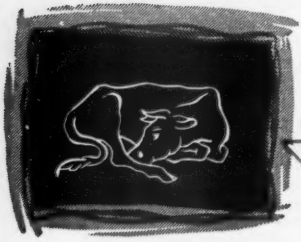

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Agalactia is uncommon in bitches and when it occurs usually derives from a critical ailment such as septic metritis or other serious infection or gross nutritional deficiency. Rare cases are due to emotional disturbances.

Staicin caronamide is a new drug said to inhibit the excretion of penicillin through the renal tubules and thus permit an elevation of penicillin concentration in the plasma to two to seven times what can be obtained with unimpeded elimination by the kidneys.

The failure of bitches to supply sufficient milk for large litters is of frequent occurrence. It is usually due, not to the size of the litter but to poor care of the bitch during gestation. This improper care may be expressed in inadequate food, qualitatively more often than quantitively, or undue exposure to the elements because of insufficient shelter, or it may be due to insanitary housing or other cause that depresses the health of the dam.

We of the machine age admire ourselves for our mechanical ingenuity; we harness our cars to solar energy impounded in carboniferous forests; we fly in mechanical birds; we make the ether carry our words or even our pictures. But are they not in one sense mere parlor tricks compared with our utter ineptitude in keeping land fit to live upon. Our engineering has attained the pearly gates of a near millenium, but our applied biology still lives in nomad's tents of the stone age. If our system of land use happens to be self-perpetuating, we stay. If it happens to be self-destructive we move, like Abraham, to pastures new.—*J. Heredity*, 37:9, pp. 275-279. 1946.

Bone diseases such as rachitis in puppies, osteomalacia in cattle and osteodystrophy in horses are associated with calcium and phosphorus intake and the ratio between them, and the intake of vitamin D.

According to the Australian council for industrial and scientific research, sterile skim milk is superior to saline solution as a menstrum for Strain 19 brucellosis vaccine, and the intradermal injection is more effective than subcutaneous injection, even when only 10% of the quantity of vaccine injected subcutaneously is used by the intradermal method.

Doctor Shabat, biochemist at Fouad 1st University, Cairo, Egypt, is reported to have discovered a "chemical vitamin" that increases promptly the amount and improves the quality of the milk flow in cases of agalactia or partially suppressed milk production in the parturient mother. The chemical vitamin is obtained from fenugreek, old time favorite in "conditioning" and "tonic" powders for horses.

Dr. J. N. Shaw, Head, Department of Veterinary Medicine, Oregon State College, in a recent experiment station bulletin, lists eight genera and nine species of tapeworms, which he has found in fish; nine genera and 13 species of flukes; 12 general and 13 species of threadworms; three crustaceans and two protozoa, a total of 38 genera of parasites infesting Oregon fish. In numerous instances the species was not identified creating a possibility that the number of species may have been considerably greater than indicated in the foregoing.

Damaged Soybeans Are Good Feed

In an experiment at the Illinois Agricultural Experiment Station, expeller process soybean meal, made from soybeans that were frosted before maturity and had lain in the field till spring, was compared with meal from first class soybeans. It was concluded that "the value of the two meals was the same for growing-fattening pigs and also at the protein levels fed, the two meals were equally efficient in supplementing corn, alfalfa meal and minerals.

Growth Limited by the Protein in the Ration

The growth of an animal is limited by the protein it consumes; more accurately by the essential amino acid which lacks the most of being adequate in the ration. All other amino acids, all carbohydrates, minerals and other nutritive elements in excess of the amount needed for the amount of growth permitted by the essential amino acid in scarcest supply are wasted. A half century ago hogs were fed a year for market and they ate 22 bushels of corn. That was because corn is low in protein and it took much of it and a long period for the animal to absorb sufficient of the essential amino acids for growth. Now swine are grown as large in six months on 11 bushels of corn by adding a high quality protein supplement to the ration.

Purebred Livestock Importations Set New High Record

More purebred livestock entered the United States for breeding purposes during the year ended June 30, 1947, than in any previous year, the Bureau of Animal Industry of the USDA announces. The total number was 36,204 of which 28,915 were cattle, 4,210 sheep, 1,885 swine, and the remainder relatively small numbers of horses, goats, dogs and cats. The importations exceeded those of the previous year by 10,232 animals, or 39%. Back in 1939, before World War II, total importations of purebred breeding animals into the United States were less than 14,000.

Under the tariff act of 1930, which provides that purebred animals for breeding purposes may enter the United States free of duty, the Department of Agriculture certifies those having papers that give satisfactory evidence of their pure breeding. The result has been to encourage the introduction of high-quality foundation stock, leading sometimes to new breeds or types, and the general improvement of domestic animals in the United States.

Among the cattle imported during the last year, the predominating breeds were Holstein-Friesian, Ayrshire, and Jersey, though nine other breeds were also represented. Of the purebred sheep, the Suffolk breed provided the largest number, followed by the Hampshire, Southdown, and nine other breeds. Most of the swine imported were Yorkshires, with the Large White, Tamworth, and Berkshire breeds constituting the remainder. The predominating breeds of horses were Thoroughbred, Clydesdale, and Standardbred, though six other breeds were represented.

The chief source of the importations was Canada, with smaller numbers of animals coming from 10 other countries, including such distant ones as Australia and New Zealand. The presence of animal diseases in various parts of the world has a limiting effect on importations, since the United States has rigid sanitary requirements for the protection of its valuable livestock industry.

Pork That Is Wasted

The annual loss of pork because of swine that die and those that are crippled in transit from the farm to the abattoir totals 16 million pounds. The loss of pork due to bruising between the feed lot and the killing floor amounts to 25 million pounds. Some of this 41 million pound loss of pork, much needed to feed the hungry, is unavoidable but a major portion of it is due to ignorance or callous indifference to pain and suffering in animals and to destruction of needed food. The loss is equivalent to the pork obtained from 200,000 swine—more than 3100 single deck carloads. Consider the amount of labor and feed necessary to produce 3100 carloads of hogs!

The Value of Sanitation

Sanitation and vaccination are a team that must work together in disease prevention if the full value of either is to be obtained in combatting most infections.

Farm sanitation reduces the amount of infection to which animals are exposed, but since it cannot approach the attainments of the surgical amphitheater, it cannot completely protect the animals from exposure.

Artificial immunization against disease is seldom as complete, as for example, natural species immunity. Artificial immunity against most diseases can be overcome by massive infection.

Herein lies the necessity for team work. Sanitation protects the animal from mass infection; vaccination protects it from the infection that remains after a good sanitary clean-up. The value of these two control measures when combined is far greater than the sum of their values when used independently.

Scientists Study Mexican Foot-and-Mouth Disease Virus

Continuation of the present vigorous campaign to eradicate foot-and-mouth disease from Mexico was strongly advised by a group of prominent international research scientists at the conclusion of a trip through infected areas in the State of Mexico that climaxed four days of consultations and discussions ending September 20. Included in the group were Dr. I. A. Galloway, of the Virus Research Institute at Pirbright, England; Dr. H. W. Schoening, head of the Pathological Division which conducts animal-disease research in the USDA; Dr. Fernando Camargo, Dr. Alfredo Tellez Giron, and Dr. Jose Figueroa, prominent Mexican research scientists. Doctors Schoening and Galloway plan to attend a meeting to be held in Bern, Switzerland, beginning September 30, where an international conference will be held on the standardization of foot-and-mouth disease vaccines.

The observations and discussions in Mexico were a continuation of research on the Mexican virus, which has been in progress at the Virus Research Institute, Pirbright, England, under the direction of Doctor Galloway. Intensive research on the Mexican virus has been carried on there with samples of the virus which Doctor Camargo took to England early in 1947. The preliminary investigations on this virus indicate that the supplies of vaccines available in Europe are unlikely to be satisfactory against this type of virus. The investigations of Doctors Galloway and Schoening and the Mexican associates were directed to studying some of the epidemiological features of the disease in Mexico. At the same time plans were discussed for a further intensive research program on foot-and-mouth disease with particular reference to the disease in Mexico.

This is the most encouraging report so far received from those in charge of the work of foot-and-mouth disease eradication in Mexico. When the resources of science are added to the known efficacy of the repeating rifle the prospects of success are improved at least 100%. "All things considered," as the lamented Howard Vincent O'brien began his column, eradicating this outbreak of foot-and-mouth disease is the most difficult task of disease control ever undertaken by anyone anywhere. Progress is being made and while the outcome is not decided the condition looks hopeful. All infection has been eradicated from three states and probably from two others. True infection in those states was very light; just a few scattered areas, but it is a start and in a few weeks, if there be no recurrence, it will shorten the quarantine line materially.

In 1926, Walker and Taylor, Punjab Veterinary College, announced the successful treatment of 11 experimentally inoculated cases of foot-and-mouth disease by intravenous injection of Lugol's solution, given after the temperature rise but before the vesicles appeared. In all but one case the animals recovered without reaching the vesicular stage and were believed not to have been capable of spreading the infection. A short period of immunity, comparable to that following a natural attack was produced in the experimental animals. The treatment was soon discarded.

* * * *

Following the military operations in North Africa during the recent war, there was a widespread outbreak of foot-and-mouth disease in French Morocco. The French veterinarians were without other means of combatting the epizootic than their own resources afforded. They bled infected animals that had high temperatures, but in which vesicles had not yet developed, and added crystal violet to the blood in the manner of making hog cholera vaccine, except that the treated blood was held only six hours at room (African) temperature before using. Good results were reported.

* * * *

Human Cases of Foot-and-Mouth Disease

Foot-and-mouth disease has long been regarded as being mildly infectious for man, but in the numerous outbreaks in this country, there appears to be no authentic record of a case in a person.

Handlers of diseased animals have not been so fortunate in the present outbreak in Mexico. *Medicina* (Apr. 10, 1947) carries an account of five cases in which the clinical diagnosis was confirmed by guinea pig inoculation. Four of these cases occurred in one family—two brothers and their parents—and the fifth was a close associate of the brothers.

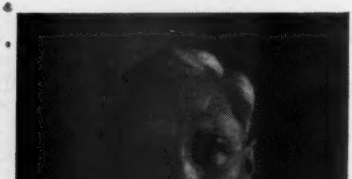
* * * *

Under earlier quarantines against foot-and-mouth disease, the cattle in Northern Mexico could have been brought across the border and marketed in the United States. The quarantine order issued by the USDA May 7, 1926, is a case in point. Under that order (issued because of an outbreak of foot-and-mouth disease existed in southern Mexico) "the importation of cattle, sheep, goats and other ruminants and swine; also of hides, skins and other animal by-products; hay, straw and feeding material originating in that portion of Mexico south and east of the Tehauntepec National Railway which crosses the isthmus of Tehauntepec was prohibited."

Vicente Ferriols, New Director, Philippine Bureau of Animal Industry

Dr. Vicente Ferriols, newly-appointed director of the Philippine Bureau of Animal Industry, is a pioneer in the veterinary profession in this country. His energy and foresight in directing animal disease control work contributed largely to the eradication of rinderpest in the Islands.

Born 59 years ago in San Antonio, Zambales, Ferriols was graduated in 1912 from the Di-



Vincente Ferriols

vision of Veterinary Medicine, Iowa State College.

Upon his arrival home from America, Doctor Ferriols was stationed over the years in various parts of the archipelago, campaigning against the dreadful rinderpest and other dangerous communicable diseases of livestock. He rose from this rank of disease fighters to become chief of the Veterinary Division of the former Bureau of Agriculture. When the Bureau of Animal Industry was created in 1930, Ferriols headed the Animal Disease Control Division until finally in May, 1947, he was appointed director, culminating 35 years of distinguished service to his country.

A member of the American Veterinary Medical Association, the National Research Council of the Philippines and the Philippine Veterinary Medical Association of which he served several terms as President, Doctor Ferriols has written much on disease control work. His paper, "Early History on Veterinary Science in the Philippine Islands," published by the National Research Council of the Philippines, is considered by local scientists to be a valuable contribution to our veterinary literature.

The task he is charged with at present—the rehabilitation of the country's depleted animal industry—is no easy one. It means bringing the livestock population to a semblance of the prewar, 150-million-peso animal industry. One of the hardest hit of the government agencies, the Bureau of Animal Industry has progressed splendidly on the meager appropriation allotted to it.

Limping on an annual two-million peso appropriation, it has commenced a large-scale importation of livestock from abroad—India, Australia, and the United States. The Bureau is sending livestock experts to South Africa to negotiate for the purchase of Africander cattle which have been found to thrive here.

Since the last quarter of 1946 the Bureau has acquired a great number of animals of different breeds; totalling one and a half million pesos in cost. These animals, swine, cattle, horses, chicken, sheep and goats, all purebred, will be used to restock our animal industry. They are available to livestock raisers at the procurement price.

Director Ferriols expects to carry on an extensive animal production program during the next few years and, given adequate financial support, hopes to raise a bigger and healthier crop of animals than has ever before been raised in the Islands. M. M. DELGADO

Korean Veterinarian in Training in United States

For two years American veterinarians in the South Korean Interim Government have been trying to arrange for additional training of promising Korean veterinarians in the United States. Although several American Veterinary Colleges have shown a coöperative attitude, the fact that the Korean yen has not yet been given international standing has prevented sending any students to this country, since their schooling would have to be financed from outside Korea.

When this matter was called to the attention of the Pitman-Moore Company, Indianapolis, by Dr. Benj. Blood, chief of the Bureau of Veterinary Affairs of the Interim Government, they arranged to finance a year's training in their laboratories at Zionsville for a Korean veterinarian.

Youn Byung Hack, a young graduate of the veterinary department of the Suwon Agricultural College,* who had worked with Doctor Blood for several months was selected for the laboratory training at the Pitman-Moore laboratories. Because of his confidence in Mr. Youn's ability to contribute to the development of veterinary medicine in South Korea,

*For a description of veterinary education in Korea see the September (1947) issue of *Veterinary Medicine*, page 322.

if he had further training in laboratory work, Doctor Blood guaranteed funds for his passage to the United States. Mr. Youn will study pathology under the immediate direction of Dr. W. S. Gochenour and bacteriology under the supervision of Dr. S. H. Regenos. Before becoming assistant to Doctor Blood, Mr. Youn was an interpreter for the Bureau of Veterinary Affairs of the South Korean Interim Government.

Eichhorn Looks Backward Over 50 Years' Experience

Dr. Adolph Eichhorn, former chief of the Pathological Division of the Bureau of Animal Industry and a former director of the Veterinary Division, Lederle Laboratories is now "learning to loaf" at Miami Beach, Florida—when he isn't dodging hurricanes.

In an interview published in *The National Horseman* for August (1947) Doctor Eichhorn, in answer to questions by "Cap'n" Flagg made substantially the following observation concerning contributions of the horse to the cure and prevention of diseases of man and animals.

"Had it not been for the blood of thousands of horses mankind might still be paying a heavy death toll to diphtheria, scarlet fever, tetanus, pneumonia and other killers.

"I like to glorify the service of horses as blood donors to combat disease rather than to discuss gaits, conformation and blood strains.

"During the Spanish-American War our losses from contagion were scandalous; during the last war there was not a single epizootic among the horses, mules and dogs, that soldiered as faithfully for Uncle Sam as did our fighting men.

"Looking back over the years I have worked with horses, and sometimes we had as many as 2000 on hand, I gained a deep appreciation of their life-saving service to both man and beast. If horses have not soldiered for freedom —to free human beings and other animals from disease and death—I just don't know what the sacrifice of blood for freedom means either on the battlefield or in laboratories.

"Most emphatically the United States is the safest place on earth to raise livestock and that is, in great measure, due to experiments conducted on horses.

"Finally tell all horsemen," insisted Doctor Eichhorn, "that whenever they climb aboard their mounts for a trail ride, a canter along the bridle path or competition in the show ring; yes tell whenever they see a horse of any kind, no matter how lowly in breed, not to forget that it has been the blood of thousands of horses which has saved millions of human lives. To that grand animal—a pal, a servant, a warrior, a vehicle of speculation, a donor of blood, that has licked plagues and saved nations from contagions—we can give no greater or truer tribute than to call him 'A life saver'."

Infectious Tumors

Lymphomatosis is apparently a naturally occurring malignant disease of chickens characterized by the formation of lymphoid tumors which may be found in nearly all tissues of domestic birds. Research makes it increasingly evident that this disease is communicable and may be transmitted under natural conditions, both through the egg and by bird-to-bird contact. It is equally evident that modifications of environment and genetic resistance determine to a large extent the incidence of lymphomatosis in experimental groups of non-inoculated chickens when they are exposed to the naturally occurring disease.—N. F. Waters in *J. Heredity*, 37:9, pp. 281-283. 1946.

Equine Encephalomyelitis Summary

The October 1st report of the Bureau of Animal Industry on the incidence of equine encephalomyelitis in 1947, shows, to that date, a total of 5273 cases were reported to the Bureau from 29 states. The incidence has been low this year in all states, except Louisiana, in which occurred more than two-third (3713) of the total number of cases in the whole of United States. Other states reporting more than 100 cases are: Minnesota, 244; California, 238; Nebraska, 191; South Dakota, 120; Colorado, 110, and North Dakota, 107. Seventeen states reported no cases and two states made no report.

Kansas to Require Two-Years Prevet

If action now pending in the Kansas State College faculty is approved, preveterinary students entering the College this year and hereafter will spend six years earning the Doctor of Veterinary Medicine degree. Heretofore five years was required, one in the School of Arts and Sciences and four in the School of Veterinary Medicine.

The proposed curriculum requires two years in the School of Arts and Sciences and four in the professional school. The recommendation has been approved by the Arts and Sciences faculty. It now goes to the general faculty for final action.

The new curriculum will apply to this year's freshmen doing preveterinary work in the School of Arts and Sciences.

McKintosh and Konst of the Dominion Department of Agriculture made a comparative test of American tuberculin which is made from the human type of tubercle organism and Canadian tuberculin which is made from the bovine type organism. Their conclusion: under experimental conditions the American tuberculin has a wider coverage in its antigenicity (in guinea pigs) than the Canadian, *i.e.*, causes more nonspecific reactions.

New Virus Diseases

Army medical officers discovered two new virus diseases during the war. One, encephalomyocarditis, caused a rather mild disease in man but a fatal disease in mice, cotton rats and monkeys and a non-lethal fever in guinea pigs and rabbits. Its pathogenicity for the larger farm animals has not been determined. In laboratory animals the symptoms are those of ordinary carditis and of nervous disturbance signalized first by loss of balance. Among soldiers in the Pacific area the infection was known as "three day fever."

The other new virus discovered causes a mild dermatitis in man, but is not known to affect animals.

Avian Pneumoencephalitis Order

Canadian Ministerial Order No. 64, having the purpose of protecting the poultry industry of the Dominion from avian pneumoencephalitis, among other requirements provides that:

"No live chickens, turkeys, pigeons, geese, ducks or other barnyard fowl, or other birds raised under domestic conditions be permitted to enter Canada from the United States unless accompanied by a certificate issued by a State Veterinarian and endorsed by a veterinarian of the United States Bureau of Animal Industry to the effect that the birds covered by such certificate are free from the contagious disease known as avian pneumoencephalitis and have not been exposed to infection emanating therefrom."

Regulations concerning the importation of eggs provide they shall be from flocks free from avian pneumoencephalitis.

Veterinary Health Division in Kansas

The State Board of Health of Kansas has created a new division in its organization to be known as the Veterinary Public Health Division. The personnel will include a Chief Veterinarian (state level), Local Chief Veterinarians, Assistant Veterinarians (state level), Field Veterinarians (local level) and clerical employees.

The duties will include: administration of the state slaughterhouse, meat and poultry meat inspection, cooperation with local health departments in the control of animal diseases transmissible to man, assistance to the Food and Drug Division in the administration of milk sanitation, cooperation with other agencies in the control and eradication of rabies, cooperation with the Livestock Sanitary Commissioner in the control of animal diseases transmissible to man and conducting such research and other functions as the state Board of Health may direct.

According to the Census Bureau there were 365,000 milking machines on the nation's farms in 1945. When improperly operated a milking machine may be a potent factor in causing a high incidence of mastitis in a herd. Properly operated it improves the quality of milk over that produced by any but expert hand milking, now a lost art in many sections.

Veterinarians in Mexico

A partial list* of veterinarians that have been assigned to foot-and-mouth disease eradication in Mexico includes:

1. From the Bureau of Animal Industry—Julius W. Amsiejus, R. J. Anderson, Jr., Aaron P. Antroinen, Richard E. Baer, Mansel O. Barnes, Wallace J. Butson, Charles T. Caraway, Wilburn B. Cochran, James W. Connelly, Rafael Cordero, William M. Dicke, Joseph H. Digranes, Arden A. Erdmann, Kenneth H. Fritts, Allen A. Heflin, George W. Hess, Robert A. Hollen, Troy S. Hopkins, J. L. Hourrigan, Owen Howells, Kenneth R. Hoyt, Paul R. Lamphear, John R. Langridge, Isaac Levine, Adolph L. Linn, George M. McGee, Earl R. Mackery, David O. Manley, Fred C. Mau, Iloyd J. Michael, Roy J. Milleret, J. H. Milligan, Jr., Francis J. Mulhern, LaRoy Noyes, Chas. Robert Omer, R. E. Omohundro, Albin G. Pass, J. E. Rasmussen, Allen W. Rice, C. C. Robenstein, Aubrey G. Robinson,Israel M. Saturen, Ernest E. Saulmon, Harry E. Schaulis, Maurice S. Shahan, Robert S. Sharman, Fred M. Shigley, Louis H. Smith, H. Hayward Taylor, Asa L. Walker, Alpha E. Wardlow, Charles Webster, Daniel F. Werring, J. T. Westbrook, Harold E. Wilson and Willard S. Young.

2. From outside the Civil Service—James W. Allen, Charles M. Barnes, Grant E. Bleke, Harold K. Cohen, P. D. Fichandler, Jean C. Flint, Walter B. Gross, C. Hackenberg, Jr., Albert L. Havlik, John B. Healy, Perrion R. Henry, F. R. Huster, Jr., Kirby K. Johnson, Milo L. Johnson, William Kaplan, J. Kenneth Kein, C. J. Koerth, Jr., John T. McAfee, Robert W. Menges, John T. Mitchell, W. T. Mosley, Jr., A. H. Munson, J. S. Orsborn, Jr., Justin T. Pinkerton, William E. Riley, Seymour Rook, Harry Rubin, Alvin H. Safanie, Robert J. Schroeder, Donald E. Simes, W. R. Strieber, Gus A. Vaninetti and James B. Young.

*From the *Federal Veterinarian*, Oct., 1947.

Easy Money from Druggists

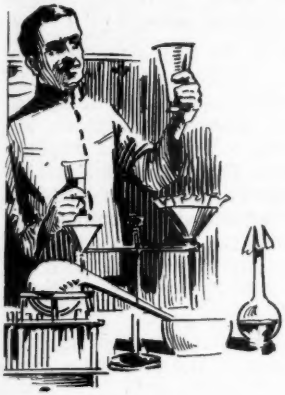
It was not to be expected that W. L. Beebe would be dilatory in cutting in on C. L. Campbell's find that druggists in considerable numbers can be induced to pay $50 for a two-day course on "animal health remedies." He wasn't.

Newspaper accounts of Beebe's recent two-day course contain the following:

"Druggists from Wisconsin, Iowa, Illinois, North and South Dakota, Michigan and Minnesota attended the instruction to learn methods and medicines for improving the health and increasing productivity of farm animals.

"The first morning Joseph J. Reynolds, bacteriologist, explained the general nature and action of disease-causing organisms. A discussion on the use of sulfonamides, penicillin and tyrothricin in the treatment of mastitis followed.

"The afternoon featured another talk by Mr. Reynolds on the common diseases of cattle, hogs, and poultry, the prevention, treatment, and symptoms of these diseases. All questions from the floor were then answered. The banquet was held Monday night, anticipating the hard work of the following day.



Prescribing for animal ills—a druggists hobby

"Tuesday morning was spent at Beebe Laboratories on the outskirts of St. Paul, where the druggists were shown how vaccines and medicines are made. That afternoon Dr. Ward L. Beebe gave a series of practical demonstrations vaccinating, drenching and dosing cows, horses, pigs, and chickens, and answered final questions from the druggists on the treatment and cures of animal diseases."

It is stated that "over 50" druggists attended this two-day course. The amount of the tuition is not stated but even at $25 per it would aggregate more than $1250.

Of course these quickie graduates don't keep their achievement a secret. The foregoing quotation is from a Superior, Wisconsin, paper and states that Arthur Moin, president and treasurer of the P. A. Lignell Drug Company of that city attended the course.

Claude Ebling, formerly county agent at Superior but now a newspaper columnist, also took a turn at boosting animal health. After criticizing the state department for a 12-year delay in giving vaccination against bovine brucellosis the go signal he says:

The same is true of other vaccines, serums, vitamins, sulphas and new medical cures. Government recommendations don't lend themselves to quick action. One day we asked Art Moin of Lignell drugstore if anyone ever used sulpha drugs to treat bangs reactor cows. We had heard humans had been cured that way. He said he didn't know.

"The talk drifted to many other topics of diseases—cures, prevention and finally Art decided to do something about information that wasn't being supplied. He adopted that hobby within his profession and as a result knows animal and poultry troubles and what to prescribe for them. His recommendations have done much good and are ahead of most recommendations that come from regular channels.

"Recently he attended a school at Beebe Laboratories in St. Paul who specialize in animal health products. Farmers in the area should benefit from Art's hobby."

That prescribing for "animal and poultry troubles" is a hobby within the profession of pharmacy seems to have been a discovery of Ebling. C. L. and W. L. can be relied upon to acquaint all druggists of the advantages of such a hobby.

* * * *

The Cost of Disease Among Farm Animals

There are numberless guesses as to the cost of disease to our animal industry. There is no collection of statistics upon which to base estimates of the loss occasioned by disease, so guesses must suffice for those concerned with this subject.

One source of information on loss of farm animals appears not to have been exploited—the dead animals handled by renderers. At present the sales of this salvage industry amount to 400 million dollars a year including hides, 64 million pounds; fat, nearly 1⅓ million tons; meat scrap, nearly a million tons. Further, since rendering plants keep a record of the hides sold a close approximation of the actual number of cattle, horses and sheep processed can be obtained. There are approximately 500 of these plants. The territory from which dead animals are collected from the farms and roadsides is distinct and circumscribed for most plants. A survey to determine the proportion of the whole farm area from which animals are collected and the average proportion of carcasses of dead animals collected would form a basis for estimation of the total number that die from disease and accidents and exposure. This would narrow guessing to the proportion of the whole number that are lost because of disease.

The Cincinnati Meeting of the A.V.M.A. II

(Continued from last month)

The Campaign Against Foot-and-Mouth Disease

No report attracted more interest at the meeting of the American Veterinary Medical Association in Cincinnati, August 18-21, 1947, than the address of Representative Geo. W. Gillie of Indiana, chairman of the Foot-and-Mouth Disease Sub-Committee of the House Committee on Agriculture. In his extemporaneous remarks the speaker reviewed the report made by his committee.

The Congress had spent 10½ million dollars on the campaign against foot-and-mouth disease in Mexico and was asked for an additional 60 million dollars for the fiscal year ending June 30, 1948. To obtain first-hand information upon what had been done with the funds already expended and the prospects for the future, a group of Representatives and Senators comprising the sub-committees on foot-and-mouth disease of the agricultural committees of both houses left Washington June 28th for an in the field inspection of the campaign against the disease in Mexico. The congressmen held two conferences with Texas cattlemen and began a five-day tour of the infected area July 1st; returning to Washington July 6th.

The committee was impressed with the spirit of coöperation that existed among the U. S. and Mexican officials in charge of the work and with the progress made in overcoming the opposition of livestock owners in the infected territory. In the beginning nearly all opposed the slaughter of the cattle, now 90% favor it.

The promptness with which quarantines have been established when the disease has been diagnosed in an area was commended by the committee as was the enterprise exhibited in killing and burying the animals after the owners were paid for them. They criticized the frequent delays in payment after appraisal, which occurred for no reason that the committee could learn except that the Mexican paymasters just didn't get around to the herd to pay for it.

While at Queretaro the committee learned that a new outbreak had just been discovered 15 miles distant and proceeded immediately to the point but the road was so difficult that it took six hours to drive there and back to Queretaro. On arriving at the infected herd they found it already guarded by soldiers.

When attempts were made to dispose of the animals before they were paid for delays were experienced because of objection of the livestock owners. The ox is almost the universal draft animal in Mexico, south of the northern tier of states. The farmer depends upon his oxen to plant his crops, cultivate and harvest them—in short, for his living. If he loses them and can't replace them he can't go on living. At least that is his view of the matter. A system has been developed by which he is paid for his condemned oxen in cash and permitted to purchase a span of mules, harness and a single shovel steel plow for the exact amount he was paid for his oxen. To insure use of the steel plow he is required to turn in his wooden plow to the government.

This plan is winning. There is some evidence its acceptance may be too enthusiastic. In Doctor Gillie's words "the trend is being accelerated as mules, harness and plows are being made available to farmers as replacements for their oxen. There was considerable indication that Mexican farmers are already being 'sold' on the advantages of mules over oxen as draft animals and there is a growing willingness on their part, if not an actual desire, to exchange their plodding oxen for the more agile mules."

Of the attitude of the Mexican Government to the eradication project the committee said:

> The Mexican Government appears to be giving the campaign its complete support. The committee believes that the American people should recognize and understand the high degree of courage it takes for the Mexican Government to support this program. For centuries the ox has been, and remains today, almost the universal draft animal in Mexico. A farmer's oxen are almost as dear to him as members of his family. They are, in addition, his only means of support. It takes political courage of a high degree to tell farmers, most of them too little educated to understand the broad implications of the situation, that their oxen must be slaughtered and buried in this campaign, even though they may have no symptoms of disease. It must be remembered, too, that in Mexico, as in the United States, there is always an opposition political party, ready to make political capital out of any mistakes of the administration—and that as regards the *aftosa* campaign this party has not been silent.
>
> In spite of these considerations, the committee believes the Mexican Government is sincerely and effectively behind the campaign to eradicate *aftosa* and that the commission will continue to have its fullest support.

The illustration shows a concentration of cattle of many owners. The cattle have been condemned and awaiting the arrival of the paymaster. Collection of many small herd into a single group possesses advantages over holding many isolated small herds in quarantine as must be done frequently in the mountains

Of the quarantine the committee reported: On its 850-mile trip, the committee estimated that it passed through 75 road blocks where persons or vehicles, or both, passing from the infected area were being disinfected. Vehicles are driven through tanks in which the disinfectant liquid covers the tires. The occupants walk in troughs containing sawdust saturated with the liquid. Trucks passing through the quarantine lines are sprayed inside and out. This is entirely the responsibility of the Mexican Army and it was reported that more than 15,000 soldiers are being used for this purpose. The committee was, on the whole, favorably impressed with the quarantine and disinfection precautions.

Inferentially the speaker criticized the slowness with which the eradication campaign got under way. Reports of the outbreak were received Dec. 26, 1946. It was approximately six months later when American equipment and supplies arrived in Mexico and, even at the time of the committee's visit, in its opinion less than half the personnel needed was then available. However, since the Congress didn't authorize the work till March 29, responsibility for the delay is not upon the disease control authorities.

The report of the committee on equipment was as follows:

American equipment and supplies did not arrive in Mexico in volume until June. It is apparently being utilized as well as possible with the available manpower and progress since its arrival is about all that could be expected. Following is a list of the major equipment on hand at the time of the committee's visit:

Track-type gasoline power shovels	10
Bulldozers	16
Jeeps	100
Weapons carriers	100
Tank trucks	5
Power spray units (for disinfecting)	68
Semitrailers	18
Cargo trucks	35
250-gallon tank trailers (for water)	22

There is now [July 1st] an insufficient quantity of American equipment on the job. In the opinion of the committee just about half as much as there should be. The mechanical task of digging trenches and burying more than a million cattle is a tremendous undertaking, particularly when the rocky condition of the soil and the inaccessibility of many herds is considered. Much more mechanical equipment is needed for the job.

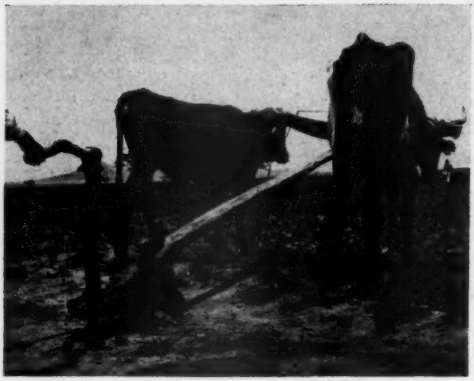
Further observations of Doctor Gillie's committee were:

It is not in the nature of most Mexican farmers to be hurried. The eradication campaign is a job which requires, first of all, speed. It is extremely difficult, however, to impress many farmers and other country workers with the need for haste, and efforts to "high pressure" them into action are likely to arouse resentment. This is a factor which cannot be avoided and which can be overcome only with the fullest of cooperation from Mexican officials and the greatest of understanding and tact on the part of American workers.

The committee observed delays in operation

which were, to its way of thinking, inexcusable. An example was the burial operation it observed near Salvatierra. Here two huge trenches had been dug, the owners of some 500 cattle had driven their animals to the site shortly after dawn, the Mexican and American appraisers were on the job—but the Mexican paymaster had failed to appear.

Other delays are perhaps more excusable but may still be very damaging to the program. The infection in the herd near San Juan del Rio was said to be several weeks old—and the cattle were still above ground. It would be two or three weeks, the committee was told, before the animals in the new outbreak seen near Queretero could be destroyed—although but two or three animals were affected at the time.



For 200 years there had been little change of methods on small farms in Mexico. The ox was still the almost universal draft animal; the plow was wooden; cultivation was by hand

It may be that, on the whole, the delay and lost motion is no greater than might reasonably be expected in a new organization trying to go into operation on so vast a scale while still in its formative stages. Nevertheless, the committee is strongly of the opinion that this situation must be improved speedily if the job is to be done.

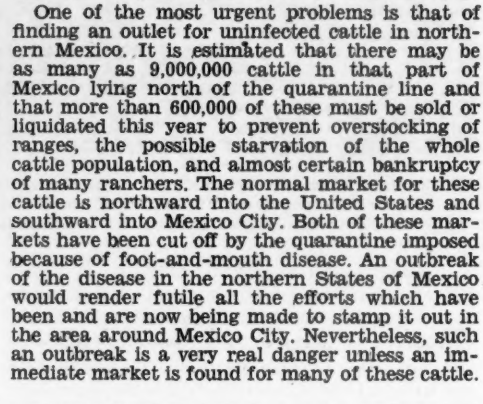
The very size of the undertaking is one of the major problems. The infection is scattered throughout some 30,000 square miles of territory ranging all the way from dense coastal jungles to 15,000-foot mountains. There are an estimated 2,500,000 cattle in this area, all of which—together with sheep, goats, hogs, and deer—will have to be slaughtered unless the disease can be virtually "stopped in its tracks." The handling of the men and machines required to do this job over this vast territory is a tremendous and expensive undertaking.

The staggering size of the undertaking is clearly delineated in the cold statistics on the number of animals disposed of and the number remaining. At the end of June, approximately 168,000 cattle had been killed and buried while an additional 26,000 from the infected zone had been disposed of by slaughter and consumption in Mexico City. The estimated number of hogs, sheep, and goats destroyed was about three times the number of cattle killed.

In contrast to the 750,000 animals disposed of to July 1st, there remained in quarantined zones, approximately 4½ million cattle, 3¾ million sheep and goats and two million swine or nearly 14 times as many as had been disposed of. More than one-fourth of these were in the highly infected zone; the remainder in areas where the foci of infection are scattered. North of the quarantine line there are an additional 16 million domestic animals and two million south of the quarantined area.

The cost of eradication will depend to a large extent on the speed with which the campaign is carried on. Virtually all the animals in zone 1 must be eradicated. Destruction must be carried out in the "other quarantined areas" to whatever extent is necessary to eradicate the outbreaks that occur. The average indemnity thus far paid for cattle is $49 per head. The total cost to the United States at the end of June was about $62 per head of cattle destroyed.

One of the most urgent problems is that of finding an outlet for uninfected cattle in northern Mexico. It is estimated that there may be as many as 9,000,000 cattle in that part of Mexico lying north of the quarantine line and that more than 600,000 of these must be sold or liquidated this year to prevent overstocking of ranges, the possible starvation of the whole cattle population, and almost certain bankruptcy of many ranchers. The normal market for these cattle is northward into the United States and southward into Mexico City. Both of these markets have been cut off by the quarantine imposed because of foot-and-mouth disease. An outbreak of the disease in the northern States of Mexico would render futile all the efforts which have been and are now being made to stamp it out in the area around Mexico City. Nevertheless, such an outbreak is a very real danger unless an immediate market is found for many of these cattle.



Then came American mules, American harness, American plows. This farmer has surrendered his oxen to be killed and his wooden plow to be burned. For the indemnity paid for his oxen he receives mules, harness and a steel plow

Conclusions

Following are among the conclusions reached by the committee members as a result of their observations in Mexico.

1. Operations must be speeded up. The eradication program is still lagging behind the disease, trying to catch up, instead of being ahead of the disease pushing it back. In the committee's opinion, operations should be at least doubled in scope and intensity.

2. Funds should be made available immediately to enable the campaign to be pursued at the highest speed and intensity with which it can be operated. The faster the campaign can be pushed, the less it will cost in the long run.

3. There should be created the office of executive director of the campaign to be filled by a man approved by the Governments of both the United States and Mexico, who has the ability to direct a campaign of this magnitude in all its ramifications and to bring about the speed, coordination, and efficiency which are absolutely essential to the success of this program. The committee specifically commends the work of the present codirectors of the campaign and does not wish this suggestion to be implied as any criticism of their activities or abilities. It believes, on the contrary, that they are performing a tremendously difficult task with remarkable ability. In justice to them, the committee believes that someone of outstanding executive ability and experience should be designated by their Governments to carry out the policies that they decide upon, so that the codirectors will be free to devote their time and energies to the policy phases of the program and be relieved of the executive duty.

Practically all the recommendations of the committee have since been carried out or the measures recommended are in the process of being effected. The personnel has been more than doubled in number and present plans contemplate the assignment of 250 American and 250 Mexican veterinarians to the work with a proportionately larger number of paymasters, appraisers and lay inspectors. An executive director having charge of all operations in the field has been appointed and beef canning has been started at Juarez and Chichuachua. The USDA has contracted for a million pounds of canned beef which will be supplied the International Refugee Association. It has been intimated the Department will buy a great deal more canned beef from plants in northern Mexico. This has brought great opposition from the horse meat canners, who want to sell to the same organization. A union of packing house workers in Wisconsin has petitioned that state's Representatives in the Congress to stop the purchase of Mexican beef on the ground that such purchases, if continued, will stop the slaughter of horses for meat and deprive the union's members of jobs. Horses are not susceptible to foot-and-mouth disease hence, for the moment, that union is unconcerned as to whether or not the disease invades U. S.

Commenting on the disastrous foot-and-mouth disease outbreak in Mexico, Dr. B. T. Simms, President of the Association and head of the U. S. Bureau of Animal Industry, said:

"It seems probable that the next several months will see the tide of battle turn, and the disease compressed into smaller and smaller areas, and that North America may finally be again free of foot-and-mouth disease."

In connection Doctor Simms added that few

One of the tragedies of foot-and-mouth disease

people understand the work the veterinary profession has done in helping to keep many foreign livestock diseases out of this country. Our farm production would have to be changed radically if some of these foreign diseases were present in the United States. The free movement of sheep and cattle from range to feed lot would be an impossibility. The present system of shipping dairy cattle from breeding centers to big city milk sheds would be fraught with constant danger. Without today's professional veterinary services the production of meat, dairy products, and eggs would be hazardous, indeed. The farmers would turn from livestock production to raising crops. Our people would then find their foods of animal origin too costly for the average income.

America is eating more meat today than ever before. Our people want about 40 pounds more meat than they were getting in 1937-41, about 200 pounds more milk, and about nine pounds more chicken per capita per annum. These figures represent an increase of about 25% over pre-war consumption.

America's increased demand for food producing animals means an increased need for veterinarians to protect the health of these animals. We shall need more men in general

practice, more state and federal employees, more food inspectors and more producers of biological agents. At the same time, he warned of the danger to livestock health of hit-or-miss diagnosis, vaccinations, and treatments by untrained persons.

Warning of several expanding animal disease threats in this country was sounded. Rabies was probably more serious in the United States last year than in any other year in history. In some areas it is becoming a serious problem among cattle. Losses among baby pigs this year were probably greater than ever before. Avian pneumoencephalitis has been diagnosed in several states which were heretofore thought to be free of it. The brown dog tick is apparently continuing its invasion of new territory.

Doctor Simms emphasized the debt the veterinarian owes the public, pointing out that all veterinary colleges in this country are supported by public funds. He declared that the veterinary profession must help repay that debt by dedicating itself to a constantly greater effort to safeguard both animal health and public health.

"One-half Our Schools Should Close"

In view of the admitted need by everyone for more veterinarians and confident prediction that even with seven new colleges functioning the demand will not be supplied in a decade, a statement by Dr. John Adams in his presidential address at the Lexington meeting 21 years ago takes on peculiar interest. He said:

"I am not in favor of trying to sell the veterinary profession to young men. I doubt its wisdom and its success. The inexorable law of supply and demand will adjust matters in due time. I have heard no appeal for competition from veterinarians, nor for veterinary service from stockmen. If the latter need service, which they cannot get, let them send their sons to a veterinary school.[1]

"We do not need more schools, but a few with superior equipment, comprehensive curricula and able and inspiring teachers. We must pay our teachers and research workers very much better salaries if we are to attract the best and provide the piece of mind requisite for the desired result.

"By comparison with European countries we have too many schools[2] attempting to turn out veterinarians. The ideal number for the United States would be four or five high grade, somewhat better equipped and manned than our best schools of today. One should be in the East, another in the far West, a third in the South and a fourth and perhaps a fifth in the Central West."

[1] One may be pardoned for asking, "Where?"

[2] Quite the opposite was the case. Leading nations of Europe, except France, have always had from two to four times as many veterinary colleges as U. S., in proportion to either human or animal population.

Educational Exhibits

A number of excellent educational exhibits were displayed. Those most visited, because most accessible, were the exhibits of the Army Veterinary Corps and of the National Society for Medical Research.

Army Veterinary Exhibit

The wide range of Army Veterinary Corps activities, in the face of the displacing of horses and mules by trucks and tanks, was illustrated by placards, photographs and drawings.

Veterinary officers now are assigned in six foreign countries as consultants on the staffs of military governments and American military missions. By directing fights against devastating animal diseases these officers play a vital role in helping stabilize a country's economy.

At the Army Institute of Pathology in Washington is maintained a Registry of Veterinary Pathology which records the pathological features of all known animal maladies in this country.

One of the most significant roles of the veterinary officer is in food inspection and by this means the prevention of diseases transferrable to man by animals through meats, milk and other foods of animal origin.

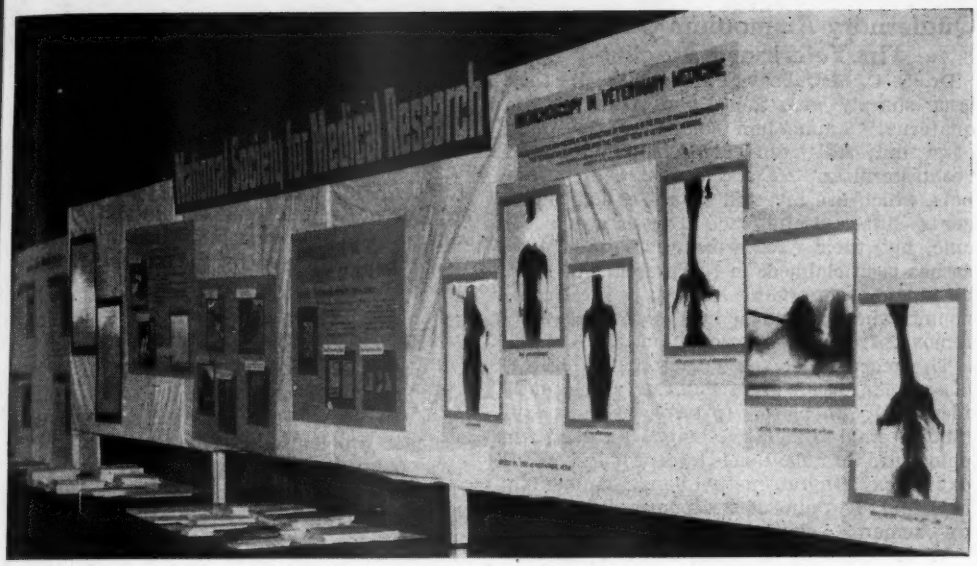
One section of the exhibit was devoted to training of veterinary officers. To keep up the high type of service given in the past it has been necessary to establish a research and development project and to improve the equipment used for food inspection and analysis.

A fifth section of the exhibit dealt with a new plan adopted this summer for the prevention and control of rabies, based largely on the experience with military dogs during the last war. It includes compulsory vaccination of all dogs on military reservations, and vaccination with three graduated doses of tested vaccine, administered at weekly intervals, once each year.

Medical Research Exhibit

The exhibit sponsored by the National Society for Medical Research was from material selected to stress the necessity for and humane nature of animal experimentation. The exhibit was selected from work done in medical schools on dogs primarily for the benefit of humans but which has benefited the dog as well. It included exhibits on *bronchoscopy, amphetamine,* and *radiation sickness.*

The bronchoscopy exhibit featured X-ray illustrations showing the location of the



MEDICAL RESEARCH EXHIBIT

bronchoscope in various portions of the lung, and an array of instruments developed for use in bronchoscopy of the dog.

Bronchoscopy is a dramatic contribution in its own right, but has also been one of the cornerstones in the development of modern thoracic surgery. The technic of the use of the bronchoscope was developed by Dr. Chevalier Jackson of Philadelphia after 25 years of hard work. It would be wasteful to allow his experience to die with him. So that the world may benefit from his studies Doctor Jackson uses the dog to teach his technics. The bronchi of no other animal so closely approximates that of the human for teaching purposes. The lives of hundreds of children and many dogs have been saved by bronchoscopy. The lives of many more dogs can be saved as knowledge of the technic becomes more universal. Dr. Ivy has invited veterinarians to bring in any dog in need of bronchoscopy to the University of Illinois Medical School where Doctor Litt, a veterinarian at the animal hospital, will use the bronchoscopy technic to help any animal in such need.

The obese dog is a recognized major clinical problem. Aged dogs and the spayed dog contribute most of the cases. By judicious use of amphetamine sulphate obese dogs may be treated for their obesity without discomfort. The mechanism of action of amphetamine was worked out by Doctors Ivy and Harris at Northwestern University Medical School. The drug may be administered by mouth or subcutaneously with equal effect. Caution must be used to avoid pitfalls of malnutrition such as the avitaminoses. Occasional idiosyncrasies are found. The drug should not be continued in animals found to be sensitive to amphetamine. The dog owner is to be cautioned against home treatment with the drug. It is to be stressed that treatment of dogs should be carried on under the supervision of a veterinarian, just as the treatment of humans with amphetamine must be carried on under the supervision of a physician, to avoid dangerous sequelae.

Dogs given 450 Roentgen units of radiation, whether by X-ray or by products of atomic fission will die unless adequately treated. Hemorrhage is one of the most striking features of the syndrome which follows acute whole-body exposure to radiation.

The picture displayed by the dog is more similar to that produced in man than that of any other animal so far studied. The hemorrhage is due to an overproduction of heparin, a chemical vital in normal amounts to prevent the blood from clotting in the blood vascular system. The antidote to heparin overproduction is protamine. Protamine injected intravenously will stop hemorrhage in radiation sickness for a time. The important part of this research, contributed by Doctors Allen and Jacobson of the University of Chicago, was the discovery of the mechanism of radiation sickness. The first step in combatting a toxic effect on living tissue is to determine what the toxic effect is and how it acts.

Quaternary Ammonium Compounds in Veterinary Practice

Dr. E. C. McCulloch, Pullman, Wash., took issue sharply with those who claim for the quaternary ammonium compound the place of a universal germicide, disinfectant and "cold sterilizer." He stated that these products, which are inverted soaps—cation detergents—have a useful place in veterinary medicine, but their effectiveness is not as wide as has been claimed. In the presence of milk, blood and other organic substances these compounds when used in high dilution are rapidly removed from the solution.

The more widely used bactericides of this class are roccal and zephiran (apparently identical), phemerol (p-tert-octyl-phenoxy-ethoxy-ethyl-dimenthyl-benzyl ammonium chloride), formula No. 144 (di-isobutyl phenoxy ethoxy ethyl di-methyl benzyl ammonium chloride), Hyamine 1662 (apparently identical to phemerol), emulsept Q.A.C. and teramine.

When tested by the Food and Drug Administration technic for evaluating antiseptics and disinfectants, all justify the very high phenol coefficient assigned to them in previous reports. The catch here, is the F.D.A. method is obsolete and while it is the legal standard it doesn't reflect accurately bactericidal values.

Plate counts of bacterial populations exposed to quaternary ammonium compounds by the author revealed a very high initial velocity of disinfection.

This was followed by a rapidly decreasing value. When the logarithms of the survivors, as determined by plate counts, were graphed against time, very steep curves were obtained for the first few minutes. In some instances, particularly when the bactericidal activity was tested in the presence of some additional organic material such as milk, the plate-count numbers again increased after several days and proteolytic decomposition of the milk took place.

It is postulated that the very high phenol coefficient of these compounds reflects the sum of the agglomeration of the organisms, and their bacteriostatic action in addition to their bactericidal action. These compounds are extremely surface-active cationic detergents, and the clumping of treated organisms, with their adhesion to glass surfaces, has been observed experimentally.

Since it appears that the tendency of organisms to agglomerate and adhere to surfaces, following exposure to dilute solutions of the quaternary ammonium compounds, has influenced the end points obtained with the F.D.A. method and the apparent volocity of disinfection when plate counts were made, both the bactericidal efficiencies and the very favorable toxicity indices of these compounds must be re-evaluated.

In some clinical applications it is possible that a surface-active bacteriostat, of very low toxicity to tissues, may be more desirable than an active bactericide which decreases tissue vitality. Also, it has yet to be demonstrated whether viable organisms coated with quaternary ammonium compounds are infective or are readily destroyed by the natural defense mechanisms of the body.

Developments Affecting Army Veterinary Service

Colonel James A. McCallam, Chief, Veterinary Division, Army Medical Department, discussed problems that face the national defense force and the Army Veterinary Corps as a part of that force. He emphasized that the time to plan for mobilization is before not after a war begins, stating that the veterinary corps has fewer than the authorized number of officers and an apportunity to get commissions in the corps will be offered this fall (1947). At the beginning of August there were 179 temporary veterinary officers on duty.

Colonel McCallam propounded a number of questions that atomic explosion has posed for the Veterinary Corps and for which the Corps is endeavoring to find the answers through research and experimentation. Some of these questions are:

What is the tolerance of radiation for the various species of livestock? How may radiation sickness in animals be detected early; properly diagnosed, and a prognosis made? What will be the effect of radiation exposure on breeding stock? What effects may radiation exposure have on the milk production of dairy cows? What danger is there in consuming milk or meat from animals subject to uncontrolled radioactivity? What effect would forage subject to radiation exposure have on animals eating it? How and when should exposed animals be slaughtered? What special technic and deviations from normal procedure is necessary? What effect would radioactivity have on canned foods; foods in boxes, bags or packages in cold storage or dry warehouses? In its role as guardian of the livestock industry and in the interest it has in the field of public health and welfare the veterinary profession must give serious consideration to these questions.

The next war will be a total war the colonel said and all measures that give promise of advantage to the user will be used. Manufacturing, communication and transportation facilities will be enemy objectives.

Veterinary Problems of the Fur Ranch

By T. T. CHADDOCK, M.S., D.V.M., Grafton, Wisc.

Ten-Year, Autopsy Study of Mink

This report deals with the individual autopsies of 4,425 mink, in which it was found that death was due to 89 different causes. These results have been accumulated over a period of 10 years on specimens that have been received from 28 different states within the United States and from all of the nine provinces of the Dominion of Canada; from a total of 685 mink ranches.

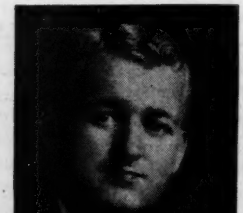
It is the purpose of this report to give the veterinarian some insight into the diseases that he may encounter in a fairly new industry; mink ranching. The various causes of death and the number of animals dying from each are listed below.

Pneumonia	947
Food poisoning	765
Fatty degeneration of the liver	630
Generalized infection	140
Cystic calculi	182
Diaphragmatic hernia	2
Jaundice	2
Abscess of the head	76
Stomatitis	2
Distemper	288
Metritis	27
Purulent necrotic pneumonia	3
Malnutrition	256
Cystitis	46
Dystocia	40
Pleuritis	5
Injury during handling	39
Toxemia	3
Uremic poisoning	5
Nephritis	71
Acidosis	34
Nursing anemia	38
Heat prostration	34
Empyema	1
Rickets	22
Occlusion of urethra	1
Abdominal hemorrhage	1
Hypertrophy of the heart	1
Killed by mother	20
Ascites	14
Chastek paralysis, B_1 deficiency	56
Dermatitis	3
Gastroenteritis	157
Peritonitis	10
Aspergillosis of the lungs	1
Hydrocephalus	1
Abscess of the liver	1
Abscess in the thorax	1
Streptococcus infection	45
Splenitis	1
Dilatation of the esophagus	1
Escherichia coli infection	5
Mating casualty	1
Paraphimosis	1
Exhaustion	1
Fibrosis of the liver	3
Myocardial degeneration	1
Rupture of the liver	2
Hemorrhage of the lungs	1
Anemia from flea infestation	2
Rupture of the stomach	1
Renal calculi	1
Protozoan infestation	2
Malformation of spinal cord	2
Tularemia	1
Endocarditis	2
Septicemia	72
Suffocation	25
Coccidiosis	18
Encephalitis (non infectious)	11
Exposure	6
Sulphur poisoning	6
Rupture of the uterus	5
Sinusitis	4
Phenol poisoning	4
Torsion of the ileum	4
Edema of the legs	3
Nematode infestation	2
Esophageal choke	2
Autophagia	1
Guinea worm infestation	1
Lung flukes	1
Aged	1
Dioctophyma renale	1
Gall stones	1
Salmonella infection	87
Hair ball in stomach	2
Screwworm infestation *(Wolfartia vigil)*	33
Anthrax	3
Cuterebra cunniculi	2
Staphylococcus infection	18
Parotitis	3
Trichinosis	1
Carcinoma of the duodenum	2
Carcinoma of the stomach	1
Carcinoma of the mesentery	1
Carcinoma of the ileum	3
Carcinoma of the lungs	1
Carcinoma of the nose	2

Practically nothing is to be found in the literature as to the comparative prevalence of diseases in mink or in fact as to the prevalence of any ailments other than distemper and certain nutritional deficiencies.

These data were collected from a field wide enough and over a period long enough and in number sufficient to give an accurate picture of the type of losses sustained on the average mink ranch by reason of disease and in some measure accident. It must be taken into account that as a rule necropsies are held only in cases in which the cause of death is more or less obscure. However, in mink, which, because of wildness, usually exhibit only the gravest symptoms and are commonly found dead without any history of ailment, the cause of death can be determined only at necropsy in a large proportion of the occurrences.

New Appointments to Illinois Faculty



The appointment of four new members to the staff of the College of Veterinary Medicine of the University of Illinois has been announced recently by Dean Robert Graham. Left to right, they are as follows:

1. Dr. Elmer A. Woelffer, formerly veterinarian and manager of H. P. Hood and Sons farms, Boston, has been appointed professor of veterinary extension. A native of Wisconsin, Doctor Woelffer received a bachelor's degree in agriculture from the Wisconsin State University and a veterinary degree at New York State Veterinary College at Cornell University in 1931. Before his appointment to the University of Illinois, Doctor Woelffer was a prominent member of the Certified Milk Producers Association of America, the Mutual Benefit Association, the Massachusetts Veterinary Medical Association, and the New England Veterinary Medical Association. Doctor Woelffer is a member of the Phi Zeta honorary society.

2. Dr. Samuel C. Schmittle has been appointed assistant in the Department of Veterinary Pathology and Hygiene. Doctor Schmittle was graduated from the College of Veterinary Medicine of Ohio State University in 1947. Since his graduation he has been in the employ of the Bureau of Animal Industry, USDA, conducting research on avian pneumoencephalitis and pursuing advanced work at the College of Veterinary Medicine, University of Illinois.

3. Dr. James R. Wadsworth, formerly veterinary inspector, in the Bureau of Animal Industry, USDA, has been appointed assistant in the department of veterinary anatomy. Doctor Wadsworth received his veterinary degree from the University of Pennsylvania in 1944, and immediately accepted a position as veterinary inspector in the Bureau of Animal Industry and was stationed in Virginia. Later he was appointed assistant instructor in veterinary surgery at the University of Pennsylvania. In March, 1946, he returned to the Bureau of Animal Industry.

4. Dr. Morris S. Cover, formerly associate professor of anatomy and physiology, Kansas State College, has been appointed to the position of assistant professor in the department of veterinary anatomy and histology. Doctor Cover received his veterinary degree in 1938 from the University of Pennsylvania, and of Master of Science from the Kansas State College in 1943. Following graduation Doctor Cover became assistant poultry pathologist at the University of New Hampshire, where he did research, laboratory testing, and diagnosis. In 1940 he was appointed to the anatomy and physiology department in the Kansas State College, where he taught histology, pathology, poultry diseases, physiology, and clinic and operative surgery. From October, 1946, until August, 1947, while on leave of absence from Kansas State College, Doctor Cover served as milk inspector for a New York city dairy. He is a member of Gamma Sigma Delta, Sigma XI, and Phi Kappa Phi honorary societies.

* * * *

Hormonal Treatment of Agalactia in the Mare

Veterinarians at the Veterinary School of the University of Ghent (Belgium) applied 1% diethylstilbestrol ointment to the udders of six pregnant mares that were known to have given little or no milk at the previous parturition. Two to three grams of the ointment were applied daily beginning 12 days before the date of expected parturition and continued until birth of the foal. Satisfactory secretion of milk resulted in all cases.—*Excerpta Medica.*

New Developments in Respiratory Diseases

In a symposium held recently at the Army Medical Center, Washington, D. C., the latest developments in medicine and surgery were discussed at a three-day session.

A resume of "newer concepts of control of respiratory diseases" by Colin MacLeod, M.D., New York University, College of Medicine, is almost as applicable to the respiratory diseases of animals, including poultry, as it is to colds, influenza and pneumonia in persons, and constitutes a fair statement of the present status and prospects of the prevention of respiratory disease in animals. Doctor Colin's discussion is summarized as follows:

Substantial advances toward control of the common respiratory diseases—colds, influenza and pneumonia—may now be close at hand, due largely to information developed from large scale, army experience during the war.

The indications are that these maladies can be reduced substantially through a combination of immunization with antigens already available and a lessening of sources of infections.

This whole group, however, still presents puzzling problems for which medical science gradually is finding answers. It is a curious fact that certain virus diseases—the group to which colds and influenza belong—never occur more than once in the same individual. That is, one attack usually confers permanent immunity. Such maladies are chicken pox, mumps, measles and small-pox. But apparently only a short period immunity, at the best, is conferred by antigens against others of this group of respiratory diseases (colds, flu).

The outstanding difference, he pointed out, is in the incubation period. The group against which permanent immunity is obtained have incubation periods ranging from 7 to 26 days. The incubation periods for colds and influenza are from one to three days. This brings into the picture the so-called anamnestic or secondary response. The purpose of an antigen is to bring about the production of antibodies to the disease by the body itself. Certain cells apparently are detailed for this work. An antigen rouses them to action, but this requires from seven to ten days.

Thenceforth, however, these cells remain on the alert. The response to a second and very much smaller dose of the antigen will be much greater and much quicker—generally in from three to six days.

Germs of the disease invading the system act precisely as "a booster shot" of the antigen. The cells which manufacture antibodies come into action at once. But, in the case of the respiratory diseases with the very short incubation periods, even the much faster reaction of the cells that manufacture antibodies is not fast enough. The malady can become established before the manufacture of antibodies can get under way.

Thus apparently there is little hope of immunizating a population against colds or influenza by "shots in the arm." It would be an unimaginably big job to keep everybody adequately immunized by repeated antigen injections all the time.

The other side of the picture, however, is that every one who has been immunized reduces by that much the amount of the infective organism in circulation. Whether one contracts a disease after partial immunization depends largely on the number of germs encountered.

It has been shown recently, for example, that the point of attack of the influenza virus is the mucous membrane of mouth and nose. When one has been immunized a small amount of the antibodies thus produced find their way to this membrane and attack the germ at its point of entrance. However, this is only from a tenth to a twentieth as much as the amount of antibodies circulating in the blood stream at the same time. To prevent influenza, other than by constant and frequent vaccinations, it is essential that the amounts of the germ finding their way to the respiratory passages be insufficient to overwhelm the minute quantities of antibody present. Thus, to insure any sort of protection, the sources of infection must be kept at a low level. One is more likely to catch influenza in an office where everybody else has a severe case, than in an office where only one man has a mild case.

Thus, he argues that every immune person serves as a wall against the spread of the disease.

This has been demonstrated in an extensive army experiment with pneumonia—a bacterial rather than virus disease, but which apparently follows about the same laws so far as immunity is concerned.

Doctor Joseph Smadel, Army Medical Department Research and Graduate School added to the foregoing that:

Finding some chemical substance which will be effective against viruses—especially the virus of influenza—is one of the major goals of present medical research. Some progress has been made in this direction. One drug which seems to inhibit temporarily the growth of flu virus is closely related to atabrine, the malaria-suppressive used on such a wide scale during the war. This particular drug

would appear to have no practical value at present. During the past month Rockefeller Institute workers have reported that certain biological substances, such as apple pectin and certain blood substances, have an inhibitory effect on the flu virus.

The status of the research at present holds out considerable promise for the near future.

Tick Borne Diseases

Four tick borne diseases, transmitted from animals to man, occur in the United States. At least two other tick borne diseases occur among animals but do not infect man.

Plague.—This disease (black death, bubonic plague) has been known since the earliest records of man were written. The loss of life in single pandemics has ranged up to 25,000,000 persons. It is due to *Pasteurella pestis* and the rat is the common reservoir of infection in Europe and Asia; the ground squirrel in the U. S. and Canada. Fleas are the primary vector and lice second in importance. However ticks are capable of transmitting the infections and sometimes do convey the disease from rodents to man.

Plague is endemic in ground squirrels west of the 100th Meridian in the U. S. and in Western Canada. The *Pasteurella pestis* has been found occasionally in rats in West Coast cities, especially in San Francisco and Tacoma.

Typhus.—This disease occurs in different forms. European typhus is chiefly louse borne with fleas the vector of secondary importance. It has been the special plague of armies from ancient times down to and including World War I. The severest form of typhus in the Western Hemisphere is Rocky Mountain spotted fever which differs from European typhus in being exclusively tick borne. A milder form of typhus occurs in the Eastern and Southeastern states which is tick borne and possibly also flea borne.

All forms of typhus are caused by Rickettsia. The vector in the Bitterroot Valley of Montana and throughout the Rocky Mountain area is the wood tick, *Dermacentor andersoni;* in the Eastern States it is the *Dermacentor variabilis* (dog tick). The natural reservoir of Rickettsia is probably small rodents, but certain large animals also—sheep, goat, bear—are susceptible.

Tularemia.—This plague-like disease is caused by *Pasteurella tularensis.* It is primarily a disease of small rodents but affects also cats, dogs, sheep and man and various species of birds.

Jack rabbits, cottontail rabbits and ground squirrels probably constitute the natural reservoir of the disease. Many biting insects and ticks are capable of transmitting the disease, but ticks and the deerfly *Chrysops discalas* are the most important vectors. The disease was formerly known as deerfly fever. The *Pasteurella tularensis* may be acquired also by contact. Infection of persons is usually a result of handling infected rabbits hence the common name, rabbit fever.

Tick Paralysis.—Some female wood ticks *(Dermacentor andersoni)* are capable of causing paralysis in dogs, sheep, young cattle and persons, especially children, by biting them. The manner in which tick bites cause paralysis is unknown. Some have guessed it is by injecting a toxin with its saliva, but they were unable to guess why occasional wood ticks cause paralysis but most of them do not. The victims recover spontaneously when the ticks are removed.

Tick fever of cattle *(Babesia bigemina)* infection is transmitted from animal to animal principally by the *Boophilus annulatus.* and anaplasmosis also may be transmitted by ticks, although biting insects are probably far more important vectors in the natural transmission of the disease. Ticks have not been incriminated for spreading equine infectious anemia, but there seems little doubt of their capacity to carry the virus, mechanically, from an infected to a non-infected animal. It is also possible for them to transmit equine encephalomyelitis.

Anthrax

Anthrax was one of the plagues of the ancients. Periodical epidemics occurred both in man and animals during the Middle Ages. When the infection in animals was brought under measurable control by the veterinary services of European nations, the disease in man became much less prevalent, the occurrence being limited mainly to persons engaged in the hide and leather industries.

In this country the infected area, "anthrax districts" have steadily increased in extent probably since colonial times. The disease in man has been regarded as an occupational one, which occurred, with sporadic exceptions, only among those employed in animal by-product industries and in agricultural regions.

A recent survey by the U. S. Public Health Service showed a 16% increase in the prevalence of the disease during the five-year period 1939-1943 and also that it occurred in many persons having no occupational connection with animals or animal by-products. Some cases were contracted from tooth brushes, shaving brushes, a fur coat. In a considerable number, the source of the infection could not be determined. The conclusion is—anthrax in persons is not rare in the United States and is becoming more common.

Veterinary Problems in Poultry Production

By W. R. HINSHAW, D.V.M., Ph.D., Davis, Calif.

The sulfonamides came in for their share of discussion at the 36th annual meeting of the Poultry Science Association held at Clemson, South Carolina, August 25-28, 1947. Dr. C. W. Barber, University of Georgia, reported that the intermittent use of 1% sulfaguanidine for cecal coccidiosis *(Eimeria tenella)* control was superior to the continuous feeding of 0.2% of the drug for six days, when treatment was started 72 hours after infection. Sulfamethazine given at the rate of 0.25% of the mash by the intermittent method was superior to 1% sulfaguanidine given by the same method. Sulfamethazine was inadequate when fed as 0.15% of the diet. When treatment was withheld for 96 hours, even 0.5% sulfamethazine failed to check the losses. Dr. Barber's results again emphasize the need for starting treatment early in an outbreak if good results with sulfa drugs are to be obtained. The intermittent method of treatment consists in giving the drug for 24 to 48 hours at the onset of the disease, then withholding treatment for three to four days, after which treatment is repeated for 24 to 48 hours.

Dr. O. E. Goff of Louisiana University in a paper on the "Concepts of Coccidiosis Control," maintains that sanitation alone has proved ineffective as a preventive of coccidiosis. He stated that under the conditions of his experiments, the continuous feeding of a ration containing either sulfur or sulfaguanidine to chicks for a two weeks period has proved a safer procedure than has intermittent feeding. Chicks retained in battery brooders until four weeks of age and then placed on range with a lot of chicks started in a clean colony brooder house suffered a higher percentage mortality for the next four-week period than did those started on the brooder floor. The feeding of either sulfur or sulfaguanidine continuously for the first two weeks on range gave the chicks a satisfactory protection from coccidiosis during the time they were adjusting themselves to the range.

Dr. K. C. Seeger, of the University of Delaware, reported on a method combining artificial infection of chicks with cultures of *Eimeria tenella* with sulfonamide treatment, and stated that it has promise for preventing coccidiosis in large flocks. *He cautions the user of his technic that the method will require a rigid standardization.* In his experimental work, he used from 15,000 to 50,000 sporulated oocysts per chick, from 15 to 28 days of age, and followed the infection in two days with either 1% sulfaguanidine or 0.4% sulfamethazine continued over tw days.

Drs. L. C. Grumbles, J. P. Delaplane, and T. C. Higgins of Rhode Island State College reported that sulfaquinoxaline fed to young chicks at the rate of one pound per ton 0.05%) by the intermitten method, prevented mortality from *Eimeria tenella* during the time required for immunity to develop.

All of these papers except Goff's show a trend towards the intermittent system of treating cecal or bloody coccidiosis with the sulfa drugs. The purpose of this system is to allow time for sporulation of a new crop of organisms and to better establish immunity. These papers indicate the trend also to the use of the newer sulfonamides which can be given in smaller dosages than sulfaguanidine. Research in progress indicates that the intermittent method may in time be supplanted by continuous feeding of mashes containing small quantities of some newer sulfonamides.

Fowl Cholera

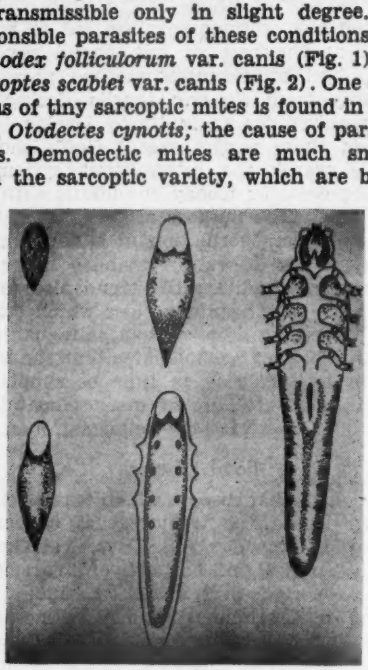
The only other disease which was given attention insofar as treatment is concerned, was fowl cholera. Drs. J. S. Kiser, L. M. Greene, J. Prier, and C. A. Bottorff, of Pearl River, N. Y., reported that sulfamethazine at the rate of 0.5% of the mash or 0.1% in the drinking water will reduce mortality in natural outbreaks of fowl cholera of chickens. An intermittent schedule of treatment is necessary, according to them, to control the disease. They also claim that such a system of treatment will cause the development of a resistance to the disease in the treated flock. At the California Station (unpublished data) this drug was effective in reducing mortality in an outbreak of cholera in turkeys by the use of 0.3% in the mash. It was also found that it was necessary to repeat the treatment at intervals, but no indication of any resistance from repeated treatments could be noted in the surviving turkeys.

Examples of other papers of interest to the veterinarian were ""The effect of avian pneumoencephalitis on egg production and egg quality," "Studies on the transmission of avian visceral lymphomatosis," "The comparative importance of genes and of supposed eggborne agents in the etiology of avian lymphomatosis," "The determination of hemoglobin in avian blood," "Quality control problems in the dressing and evisceration of poultry," "Potassium as an excitant to blue comb," "Prolapse in 13 inbred lines of White Leghorns," "Finishing market turkeys with estrogens."

Acariasis and Its Treatment*

By JOSE GONZALES ALVAREZ
Cartagena, Colombia

DEMODECTIC mange and sarcoptic mange in dogs, called *"chande"* in Colombia, are serious debilitating skin diseases. The latter is readily communicable while the former is transmissible only in slight degree. The responsible parasites of these conditions are: *Demodex folliculorum* var. canis (Fig. 1) and *Sarcoptes scabiei* var. canis (Fig. 2). One other genus of tiny sarcoptic mites is found in dogs' ears, *Otodectes cynotis;* the cause of parasitic otitis. Demodectic mites are much smaller than the sarcoptic variety, which are barely



Demodex folliculorum var. *Canis*
Fig. 1. Found in hair follicles and in sebaceous secretions, causing follicular mange in dogs

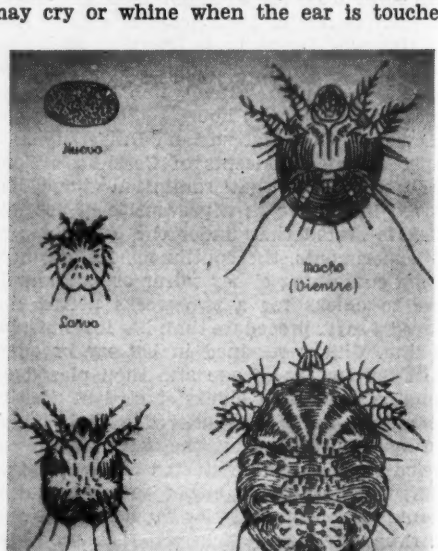
visible to the naked eye under the best of lighting conditions.

Demodectic mites live in the hair roots and for that reason the affection is called *"sarna profunda"* (deep mange). Sarcoptic mites attack the skin from the surface and the affection is called *"Sarna de rascarse al aire"* (itching air mange).

Symptoms.—Early symptoms of demodectic mange are a moth-eaten appearance of the coat, redding of the skin, very little if any itching in most cases but in some cases there is intense scratching as in the scabies. Bare spots show first around the eyes (Fig. 3), on the crown of head and on legs; in severe cases almost the entire coat may be lost (Fig. 4). Inflammation localizes in the hair follicles, pus germs enter, produce pustules. They enlarge, coalesce and cause sores. The skin loses its redness, becomes gray, thickens, may form in ridges (Fig. 3) and emits a disagreeable, characteristic odor.

Sarcoptic mange begins with red spots on any part of the body; at the root of the tail, on the head, shoulders, abdominal wall, the median surface of the thigh, the legs, in the axilla, etc. It may soon cover all the body (Fig. 7). Irritation papules and excoriations result. The intense itching and scratching results in subsequent bacterial infection; usually by cocci. The affected dog weakens and becomes emaciated, thus differing from the effects of demodectic mange in which the appetite is normal or slightly increased.

When scabies mites affect the ear they cause parasitic otitis. One or both ears may be affected. If in one ear, a dog will carry the head with the affected ear turned downward. He usually excoriates the ear by scratching, and may cry or whine when the ear is touched.



Sarcoptes Scabiei var. *Canis*
Fig. 2. Is responsible for sarcoptic mange in dogs. This burrowing mite has spines, scales and bristles on its back

A stinking yellowish exudate may be seen in the ear and may discharge and stick to surrounding hair. Raw sores may cover the ear flap. Partial deafness often results. Dogs may become irritable, nervous, morose, afraid of

*Abstract of the thesis "Valor Terapeutico del Ajo y el Aceite de Chalmugra en las Acariasis," submitted in partial fulfillment of the requirements for graduation by Facultad de Medicino Veterinaria, Universidad Nacional De Colombo.

people and inclined to bite; sometimes they are suspected of being rabid. Diagnosis may be confirmed by detection of the mites in the detritus by microscopic examination.

Medicinal Agents

Garlic is a bulbous plant of the genus Allium *(Allium sativum)*. It belongs to the liliaceae or lily family of plants, which includes also the onion.[3] The bulb of garlic is employed as a digestive stimulant and pectoral[4] or bechic. It has a peculiar odor and, given *per os*, the odor is so marked that it appears to be escaping from every pore.[5]

Chaulmoogra oil is a yellowish, fixed oil expressed from the seeds of a bixaceous tree of Southern Asia, *Taraktogenos kurzii*.[1] This oil thickens, hardens and becomes solid at temperatures below 25° C. (77° F.). It is freely soluble in alcohol and fat solvents. It is neither toxic nor irritant. It has been used in the treatment of leprosy[1] and also employed against rheumatism.[2] This oil, after injection intramuscularly or subcutaneously, acts by increasing the white corpuscles of the blood, therefore is indirectly a bactericide.[2]

Therapy

Both sarcoptic and demodectic mange impose difficulties in treatment. Especially is this true of the latter. They require persistent and continuous treatment. The writer has employed both internal and external treatments.

Fig. 3. Bare spots around the eyes in Case 1

Infested dogs should be clipped very closely, that lesions may be more readily detected and topical treatment more thoroughly applied.

Technic of Oral Treatment.—The author long since learned that it is not always an easy matter to give garlic to dogs; a natural fear of being bitten, on the part of the owner; a dog with a cross disposition or one that is very strong or unruly only add to the ordeal. Rather than fight the dog, which intensifies his distrust, simply take the bit of garlic or the extract in capsule form and secrete it in a small piece of meat, cake or cheese and offer it to him as a tidbit, quickly following it with another very small piece to make him anxious. So the dog quickly swallows them and the practitioner retains his confidence and the dog will not be on the offensive when the treatment has to be repeated

After observing this precaution, administer *per os*, according to the size of the animal,

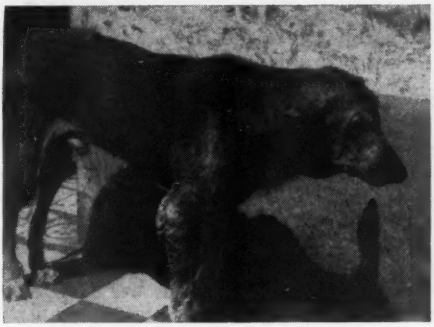


Fig. 4. The entire coat may be lost

30 grams of garlic per day for large dogs; 20 grams for dogs of medium size and for small dogs 5 to 10 grams daily.

Technic for Topical Treatment.—Clip the dog removing all the long hair (Fig. 13). Bathe the dog daily with lukewarm water and carbolic soap; making a thick lather, which is worked well into the skin and allowed to stand 5 to 10 minutes. Then remove the softened scabs. Rinse thoroughly with lukewarm water and keep the dog in a warm place at least for two hours in cold climates. In warm weather this precaution is not necessary.

After drying the dog, apply, twice daily, whole chaulmoogra oil or the oil combined with a fat solvent like alcohol, acetone, ether or chloroform, which facilitates penetration of the oil into the pores of the skin, so the eggs of the mites may be killed by contact with this oil. This remedy being non-irritating may be applied around the eyes without any risk.

Sometimes demodectic and sarcoptic mange become very serious and severe in some parts of the body, for instance, in the bend of elbow (Fig. 4), at the root of the tail or on the posterior point of the hip. The skin thickens and forms ridges that prevent the parasiticides from reaching the larvae and eggs because of their highly protected location called *"tronera."* For those cases, injections of the esters of chaulmoogra, type 7, iodide 0.5% (*Esteres de Chalmugra, tipo 7, yodado al* 5%), are made into the skin.

For ear mange, clean gently with a cotton swab to remove the detritus, wax or other matter, from inside the flap and the external auditory canal, using alcohol, chloroform or

ether, with gentle traction upward and outward on the flaps of the ear. Dry the ear and then dip the swab into chaulmoogra oil and apply thoroughly to the canal walls and any other affected parts.

At the same time, it is best to feed mangy dogs an abundant, easily digested ration. They appear to do best when fats, gravies and appetite stimulants like gentian, rhubarb, potassium bitartrate, jalap or small quantities of calomel, are omitted from the diet.

Advantages of Simultaneous Treatment with Garlic and Chaulmoogra Oil

Garlic attacks the parasites from the inside of their habitat. When the parasites attempt escape from the disagreeable odor of garlic that exudes from every pore of the body, they contact the chaulmoogra oil, on and near the surface of the skin, which destroys them. These remedies are non-injurious to man or animals and children can play with their pets without risk; moreover, these medicaments definitely benefit the skin, leaving the coat soft and lustrous.

Clinical Reports

Case 1 (Fig. 3).—The depilation was confined in an area surrounding the left eye. There were no symptoms of dermatitis, yet moderate scratching was noted. The appetite was increased.

The photograph of the owner indicates he too had demodectic mange (Fig. 5) and illustrates the position of the pimples; one between eyebrows and on the upper point of the nose; three on the left cheek and two small ones under the lower lip. Microscopic examination of the semi-chessy, pus-like material expressed from the facial pimples of the owner revealed mites identical to those detected in the skin of the dog.

This is by no means the only instance in which the writer has observed what appeared to be demodectic mange in the owners of dogs similarly affected. In this instance, however, the owner stated he had been plagued with facial pimples for a long period but the dog's attack was a recent one.

This dog was treated by giving 10 grams of garlic extract in capsule, morning and afternoon, and simultaneously applying locally whole chaulmoogra oil to the affected area. Only five days were necessary to cure this case. There was no recurrence over several weeks that the case was followed.

Case 2.—In this case bare areas encircled both eyes. The owner reported that the animal scratched and rubbed the affected parts with the forelegs and against all manner of objects, indicating a definite itching.

The treatment required 17 days under rigid adherence to the plan and details for Case 1; except as to the doses of garlic, five grams of which was given each morning and afternoon.

Case 3 (Fig. 4).—The accompanying illustration shows that the disease had made this dog miserable and repulsive. He was brought to me with a history of having been treated with various remedies by two other veterinarians without improvement. He had been affected two months and the owner's request was: "Please Doctor kill him because I can't stand to see my pet so pitiful." However, treatment was recommended. The entire body, including the head, ears and legs, was affected.

Fig. 5. The owner

Treatment was applied rigorously; daily doses of 30 grams of garlic were given, pure chaulmoogra oil was smeared over the whole body, and esters of chaulmoogra were injected into thickened areas of skin at the elbows. After a period of 30 days, there was a marked improvement and in five months the animal had a perfect coat and showed no evidence of disease (Fig. 7). Now, six months later, there is no evidence of recidivation.

Fig. 6. After clipping, the nodules in Case 5 were clearly evident

Case 4.—This is very similar to Case 3; except that in Case 3 the skin was gray in color and this was an acute case of red mange. The

hair was rubbed off and the legs quite badly swollen. The treatment was the same as that of Case 3 except since it was acute, it was not necessary to inject esters of chaulmoogra. Only 40 days were required to affect a cure.

Case 5 (Fig. 6).—This case shows back and hips of a bitch affected with sarcoptic mange. The clipped area shows nodules such as were evident under the hair over the entire surface of the body. They could be felt by running the hand lightly over the animal. After the bitch was clipped (Fig. 6), the nodules were clearly evident.

This case was treated the same as Case 1, except that a few drops of ester of chaulmoogra were injected into the skin in a few areas. Only 10 days were necessary to effect a cure with simultaneous treatment of garlic and chaulmoogra oil.

Case 6.—In this case of sarcoptic mange, the condition was confined to the axillae, elbows, back, root of the tail and posterior part of the hips. There were areas of intense itching which were almost frantically scratched.

Fig. 7. Same as figure 4; shows no evidence of the disease five months after treatment

Treatment.—Thirty grams of garlic in extract form and chaulmoogra esters in intradermal injections in the affected parts were given twice daily for 18 days. At the end of a month the dog had a perfect coat.

Case 7 (Fig. 8).—This was a case of sarcoptic mange. The presence of the nodules was evident and easy to detect because the hair was short. The symptoms were similar to Case 5 and the treatment was exactly the same, but it took three months to cure it.

Case 8.—This was a case of parasitic otitis. As soon as it was suspected that the otitis might be caused by Otodectes mange mites, specimens were obtained and examined under the microscope. The yellowish discharge was found to consist of *Otodectes cynotis;* pus and such excretory products as are usually found.

Fig. 8. This dog, Case 7, was affected with sarcoptic mange

Carefully cleaning the ear canal and swabbing it twice daily with chaulmoogra oil and giving 15 gm of garlic twice daily constituted the treatment: recovery in 20 days.

All these dogs are now healthy animals, some one to two years and others six to 10 months after treatment; there is no evidence of the parasite or the lesions which it causes.

Conclusions

For the past four years, the author has given considerable time and attention to the treatment of the skin parasites and skin diseases in dogs.

Simultaneous employment of garlic and chaulmoogra oil has been in the nature of an experiment representing an effort to get away from other mange treatments altogether. It is my opinion that this combination constitutes a distinct advance over other methods avialable when the *Allium sativum*-chaulmoogra oil treatment was commenced.

With equally encouraging results, the author has treated 33 cases of demodectic mange, 25 cases of sarcoptic body mange and eight cases of ear mange in dogs.

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Equine Infectious Anemia in New England

About the end of May, horses that had been racing in Florida were shipped to Suffolk Downs, a race track near Boston. Some of them are reported to have been sick. Soon after arrival of the horses, horse flies from a nearby swamp were noted on them in considerable numbers. At the close of the racing at Suffolk Downs most of the horses were shipped to the Rockingham Park race track near Salem, New Hampshire, others went to Narragansett Track in Rhode Island and others to various points.

Disease and deaths among the horses shipped to Rockingham became alarming. August 20th Dr. R. W. Smith, state veterinarian of New Hampshire, requested assistance of the B.A.I. in diagnosing a suspected outbreak of equine infectious anemia. Dr. L. O. Mott of the Pathological Division made an investigation and after examining some of the animals collected blood specimens from 14 that from the symptoms and history he suspected of having swamp fever. Horse inoculation tests later confirmed the diagnosis in all cases.

In the meantime Dr. C. D. Stein, also of the Pathological Division of the Bureau made a further investigation at Rockingham Park and elsewhere in New England. He conducted several necropsies on horses that had died and conferred with many veterinarians and horsemen. His observation confirmed the conclusion reached by Doctor Mott.

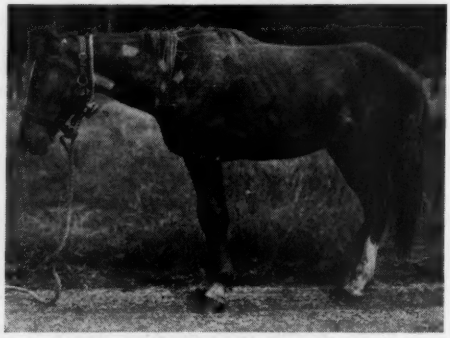
The diseased and exposed horses at Rockingham have been put under indefinite quarantine. Forty-seven cases have been diagnosed clinically but the Bureau points out that there are probably a much larger number of subclinical infections and that rigid quarantine of the Rockingham horses and any others that are suspected of being infected should be maintained until their status has been determined by horse inoculation tests.

Before a diagnosis of the ailment was made various treatments had been given to the affected and exposed animals. Officials of the Bureau are of the opinion that the disease was spread in some measure by hypodermic injections. The virus of equine infectious anemia is present in the blood stream continuously from the time of infection throughout the life of the animal, which if it be cared for carefully may be many years. A minute quantity of the blood of an infected animal—a quantity that may adhere to a hypodermic needle if it be not carefully sterilized—is easily sufficient to infect another animal if injected under the skin.

This appears to be only the third outbreak of the disease in New England, an outbreak in R.O.T.C. horses at Harvard University in 1936 and in Vermont in 1939, being the only previous reports of the disease in that area.

In sections where equine infectious anemia occurs every year and the veterinarians see much of it, they develop great skill in making accurate clinical diagnoses. However, when seen for the first time or the first few times, diagnosis from the history and symptoms, and even after necropsy is difficult and uncertain.

The chief symptoms are loss of weight, weakness, recurring fever, and swellings on the abdomen and legs, rapid pulse and exaggerated heart sounds. The disease gradually saps the strength of its victims thus reducing their endurance for work or strenuous sports. In



Acute case of induced infectious anemia 10 days subsequent to treatment by Stein, Mott and Heishman, with six million units of penicillin and four days before death

the acute form of the disease the animal seldom lives over 15 to 30 days. More often, the infection develops into a chronic condition marked by intermittent attacks of fever and weakness. Necropsy findings in chronic cases include emaciation, extreme paleness of muscles, slowly clotting blood and great enlargement of the heart and such fat as can be found in the carcass varies in color from light yellow to orange.

No dependable treatment or prophylactic agent has been developed and, so far as known, an animal when once infected is always infected. The Bureau of Animal Industry reports cases, observed in experimental studies, in which chronically affected horses remained infectious for periods of 14 and 15 years.

Equine infectious anemia is an important disease of solipeds of world wide distribution. It has existed in the United States for at least 50 years and perhaps much longer. The area in which the disease is known to occur has been extending for 40 years. Because of its importance research on it has been conducted at many of the state experiment stations. Since, so far as known no animal other than those belonging to the equine family is sus-

ceptible to the disease, research is expensive and progress slow.

The disease has been under continuous study by the Bureau of Animal Industry, USDA, for many years. A fairly complete record of developments in these studies during the past decade may be found in the following publications:

Gochenour, W. S., Stein, C. D., and Osteen, O. L. Sulfanilamide in the treatment of equine infectious anemia. *Vet. Med.*, 34:7, pp. 424-430. 1939.

Stein, C. D., Osteen, O. L., and Mott, L. O. Chemotherapeutic studies of equine infectious anemia. *Vet. Med.*, 36:6, pp. 306-310. 1941.

Stein, C. D., Lotze, J. C., and Mott, L. O. Transmission of equine infectious anemia by the stablefly, *Stomaxys calcitraus*, the horsefly, *Tabanus sulcifrons*, and by injection of minute amounts of virus. *Am. J. Vet. Res.*, 3:7, pp. 183-193. 1942.

Stein, C. D., and Mott, L. O. Studies on the congenital transmission of equine infectious anemia. *Vet. Med.*, 37.9, pp.

Stein, C. D. History and distribution of equine infectious anemia in the United States. *Vet. Med.*, 36:8, pp. 410-414. 1941.

Stein, C. D., Osteen, O. L., Mott, L. O., and Shahan, M. S. Experimental transmission of equine infectious anemia by contact and by body secretions and excretions. *Vet. Med.*, 39:2, pp. 46-52. 1944.

Stein, C. D., and Mott, L. O. Susceptibility of animals other than solipeds to equine infectious anemia. *Vet. Med.*, 39:11, pp. 408-413. 1944.

Mott, L. O., Stein, C. D., and Heishman, J. O. Penicillin treatment of acute equine infectious anemia. *Vet. Med.*, 41:4, pp. 131-136. 1946.

Stein, C. D., and Mott, L. O. Equine infectious anemia in brood mares and their offspring. *Vet. Med.*, 41:8, pp. 274-278. 1946.

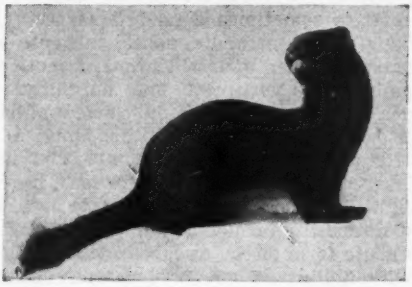
Stein, C. D., and Mott, L. O. Suspected case of equine infectious anemia in man. *Vet. Med.*, 41:11, pp. 385-388. 1946.

The Horse Meat Industry

Among legitimate livestock businesses, the one that operates with the least fanfare is probably the horse meat industry. Likely that is why, only a few years ago, canned dog food manufacturers, whose dog food contained no meat product but meat scrap from rendering plants or putrid offal from butcher shops, thought it profitable to put "Contains no horse meat" on their labels.

Plainly the slaughter of horses for food of man or animals is decreasingly unpopular. Since September, 1919, when the Horse Meat Act went into effect, the Bureau of Animal Industry, USDA, has maintained inspection at abattoirs engaged in the slaughter of horses for export, but it is an unpublicized branch of B.A.I. work. Recently when this Magazine proposed to publish an illustrated article on horse meat inspection at an official establishment the matter was disapproved. Twenty-five years ago, Chappell Bros. erected a high fence around their plant at Rockford, Ill., and stationed a guard at the closed gates.

During the war, horse slaughtering boomed from the prewar figure of three million pounds annually to 41,500,000 pounds. During the war there was some consumption of horse meat as human food in this country, but the increased slaughter went mainly to fur farms, pet food manufacturers, zoological gardens, fish hatcheries, circuses, and into certain high protein supplements for animal feeds. Other sources of animal feeds were unavailable for some of these consumers and in short supply



Recently 60 farm horses were sold at auction. Farmers bought four of them but fur animal breeders outbid the farmers on the other 56

for others with the result that the horse meat industry underwent a great expansion. The establishments engaged in slaughtering horses increased from three to 23 and the number of animals slaughtered increased from approximately 20,000 to 156,872 annually. The increase in slaughter was greater than these figures indicate, since many fur farmers put in small slaughter house equipment and slaughtered the animals necessary to feed their own fur animals. Such kill is not included in the foregoing statistics.

Surprisingly horse slaughter has continued at this same high rate since the close of the war and the industry is now faced with the difficult problem of finding new sources of supply. The USDA announced recently that it would purchase 6,595,000 pounds of canned horse meat for foreign relief at approximately 14.5 cents a pound delivered in New York. The number of farm and city horses have decreased by more than two-thirds since World War I and, if the present trend continues another decade, this source will not supply sufficient animals for more than a few of the plants now in operation. Wild horses, it is estimated, will not be a commercial factor longer than three more years.

An even more difficult problem confronts fur farms and zoos. What to do when horse meat is no longer available? Possibly they are at the threshhold of a new type of livestock farming—hamster raising.

Swine Erysipelas*

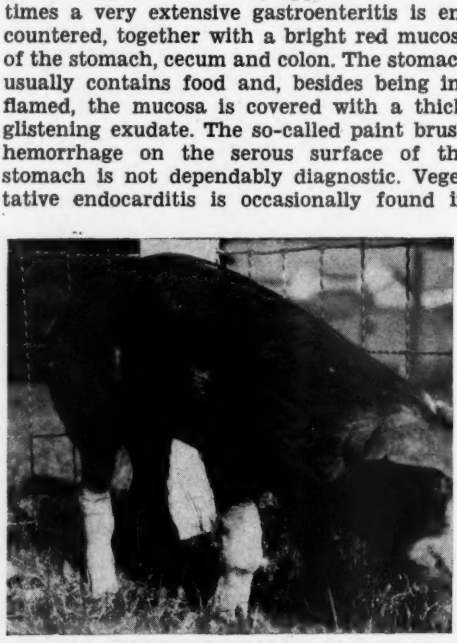
Swine erysipelas is a disease about which not much is known. It is due to an organism—*Erysipelothrix rhusiopathiae*—that possesses the capacity to live in the soil for long periods; perhaps indefinitely. The circumstances that cause swine on infected ground to contract the disease are not known.

Swine erysipelas runs a most variable course and presents a wide range of symptoms. At times it is very difficult to diagnose in the field. It is sometimes described as occurring in four forms—peracute, acute, subacute and chronic. However, a classification of acute and chronic serves very well. The morbidity rate varies greatly. Sometimes only a few animals in a drove are affected. At other times all or nearly all the animals succumb. The mortality is equally variable. There may be only a slight death loss or anything up to 50%. The first notice the farmer has of the presence of the acute form of the disease in the herd may be the finding of one or two dead animals some morning—animals that appeared to be all right the night before. In the chronic form he may see it only in enlarged joints in pigs that do not thrive well, and it may continue in this form for two or three seasons and then suddenly become acute and begin to kill affected animals.

Symptoms.—Swine erysipelas is a septicemia. At the onset temperatures are very high—107 to 108° F. being common. Stiffness and soreness are early symptoms. Affected animals lie in the nest and are aroused with difficulty. When they try to arise, they evidence great pain and sometimes have to be helped to their feet, because of the soreness and stiffness. After they move about for a time, the stiffness diminishes appreciably. There is alertness and activity, a contrast to the depression and weakness in hog cholera. In fact nervousness is fairly characteristic. There may be severe conjunctivitis but the eyes are bright—sometimes too bright. The appetite persists almost to the end. Gumming of the eyelids is not noted. Constipation, diarrhea or coughing are not encountered except when complications occur. We may find scarlet, congested areas in the skin, which blanch on pressure. This redness may be diffuse or at times circumscribed assuming a diamond shape, hence the name, "diamond skin disease." The latter is considered a chronic form of erysipelas. Enlarged joints are often seen and stocking of the legs. Also, at times there is swelling of the ears and in the region of the tail. Welts or urticarial rash may appear over the body. In chronic erysipelas, sloughing of patches of skin occurs, usually over the shoulder and also on the ears and tail. None of these symptoms are constant and all vary in degree.

Turkeys are susceptible to swine erysipelas and, if in contact with the swine, their condition may be of diagnostic importance.

Lesions.—There are no lesions that are diagnostic. They are often those of a generalized septicemia, not discernibly different from lesions usually associated with hog cholera. Pulmonary edema is frequently associated with erysipelas. The lymph glands may be enlarged, dropsical and hyperemic. The lymph in the glands may have a bloody appearance. Sometimes a very extensive gastroenteritis is encountered, together with a bright red mucosa of the stomach, cecum and colon. The stomach usually contains food and, besides being inflamed, the mucosa is covered with a thick, glistening exudate. The so-called paint brush hemorrhage on the serous surface of the stomach is not dependably diagnostic. Vegetative endocarditis is occasionally found in the chronic stage of the disease, but this lesion is not as common in swine as it is said to be in man. However, when present, this cauliflower-like growth is quite characteristic of erysipelas although it may be found, occasionally, as the result of certain streptococcic infections. Enlarged joints contain an excessive amount of flaky synovia. In the acute stage the spleen is usually enlarged and bluish red in color.



Barrow showing pronounced enlargement of the right carpus as compared to the normal left joint. The lack of condition shown here is characteristic of animals severely affected with swine erysipelas

The only definite method of diagnosis is by laboratory procedure. However, a negative

*Notes from discussions at recent veterinary meetings.

laboratory report does not prove the absence of swine erysipelas in the herd, since often the only location from which the causative organisms can be isolated is an infected joint. It is, therefore, a good plan to include a swollen joint with any specimens submitted for laboratory examination. Simply saw off the leg above and below the joint but do not incise the capsular ligament.

Response in acute cases, to the injection of swine erysipelas antiserum usually occurs within 24 to 36 hours. Many times spectacular improvement is noted in this short period. The serum is frequently used in this manner as a diagnostic aid. Sick animals so treated should be marked, otherwise one may be unable to identify them next day.

Control.—Since swine erysipelas and hog cholera, are both generalized septicemias, differentiation between them is frequently difficult. They sometimes coexist and then the problem of diagnosis may be insoluble, clinically. Fortunately, hog cholera antiserum and virus is not harmful to animals affected with swine erysipelas. It is probably the only infectious disease of swine, other than hog cholera, that is not aggravated by the serum-virus treatment. Hence two plans of procedure are indicated in herds in which swine erysipelas is suspected but some doubt exists as to the diagnosis. (1) If the herd has been properly immunized against hog cholera, swine erysipelas antiserum is given. (2) If the herd has not been serum-virus treated, both the swine erysipelas serum and the hog cholera serum-virus treatment is given. In either case immediate steps are taken to obtain a laboratory report on specimens.

The protection afforded by swine erysipelas serum is of short duration and, if the laboratory report is positive, for complete safety the serum treatment requires to be repeated on the well animals at two-week intervals as long as the danger lasts, which may be until the animals are marketed. A plan more often followed is to repeat the serum injection only if, and when, animals sicken with the disease. Sick animals should always be identified preferably by hair markings, since if they recover they will be immune and there is no necessity to give them further injections of serum.

The simultaneous culture-serum treatment is an effective preventive of swine erysipelas, but it should not be employed until it is definitely established that *Erysipelothrix rhusiopathiae* infection exists on the premises.

After the herd is treated the premises should be cleaned up by burning the manure, bedding and trash. Wallows should be filled and drinking troughs and feeding floors disinfected. It is not practical to disinfect the soil but removal of the swine to a new area may accomplish some good. In any case, a good "clean up" should decrease the chances of future outbreaks, and even if it doesn't do so it is still worth while because of the parasite eggs it eliminates. Sanitation is something the average swine raiser has to be scared into. If hog cholera or swine erysipelas will provide the scare there is some gain from them.

In performing necropsies on carcasses suspected of being infected by swine erysipelas, in fact in all handling of swine suspected of being infected with *Erysipelothrix rhusiopathiae* the veterinarian should wear gloves and observe precautions, since the infection is readily acquired by man, in whom erysipeloid is a painful, stubborn and dangerous local infection that may become generalized.

Animal Welfare in the War—and After

By CAPT. ERIC HARDY, F.Z.S.
Liverpool, England

ON the collective farms of the Soviet across the broad, swift waters of the Volga river, the large, two humped bactrian camels which pulled the Red Army heavy artillery into position during the siege of Stalingrad, now pull the hay wagons of the Russian harvest. The white Arab stallion which was to have carried General Rommel into the hot, dusty streets of Cairo is now, at about 10 years of age, the property of Rommel's conqueror, Field Marshal Lord Montgomery. Dogs which did war service guarding lonely RAF (Royal Air Force) airfields in France and England are now returned to their civilian owners (although some have proved too savage from their "guard dog" training to settle down again as safe and reliable home dogs) and record prices, the highest ever paid in the history of pigeon-racing, have purchased veteran war pigeons for the breeding lofts of keen hobbyists. Japanese war horses are remounted in the new Siamese cavalry, or working for the rehabilitation of Burma and Malay.

Thus is the aftermath of the animals' part in the war. Before we discuss the veterinary problems that arose amongst the many nations fighting for those six weary and wasted years on three continents, let us make a brief recapitulation of the unnatural conditions animal welfare workers came up against when animals were used in the campaigning. Atom bomb publicity, tank production costs and airplane designs have given the war a very misleading, mechanical monopoly. Animals were of course used extensively right to the end. Extensive camel corps patrols were used by the French, British and Arab troops in North and East Africa and the Near East, the French and Greek armies had extensive oxen-drawn heavy transport, the Russians and the Finns had reindeer-drawn transport, medical supplies and even reindeer-mounted despatch riders or messengers on the snow-covered Murmansk front, ridden or driven by Lapp, Samoyed and Yakut troops. Both the British and the Japanese armies had elephant units in the last three years of the Burma campaign, mostly working with the field engineers in bridge construction and road making during the monsoons when mechanical transport was bogged. The early Japanese invasion captured nearly all the British elephant force during the Chindwin retreat, and only 50 of the animals were recovered. The Japs used many elephants in the invasion of Manipur: 350 were used to haul British supplies across the Chindwin in the advance and the RAF bombed as many as 50 Jap elephants as military air targets. Finally there was an Allied Elephant Force under the command of Colonel James Williams.

In the muddy hills of north Italy during the rains, Indian and Cypriot mules were invaluable parts of British transport, even for mobile wireless stations, owing to the bogging down of motor vehicles. The German army used a million horses for infantry platoon transport and the story of the pigeons, the dogs and the mascots has been told often.

The biggest battles of the veterinary services were fought in the South East Asia battle fields of swamp and jungle. The Far East has always been notorious for animal plagues and the complexity of modern war could have seen military operations broken by epizootics amongst active service animals. The Indian Army Veterinary Corps, aided by the British Royal Army Veterinary Corps, had one of the toughest jobs of the war. It has been said that they fought sixty-five battles a month in their theatre, *i.e.*, they had to contend with 65 epizootics. Nearly all I.A.V.C. officers were graduates of British or Indian veterinary colleges. Before entering upon active service, Indian and British veterinary officers spent a two months' course at Ambala, India, as a battle school for tropical war diseases. Here they were also taught how to fight as soldiers as well as serve as veterinarians. I.A.V.C. enlisted troops spent five months at this training centre for technical veterinary and military instruction, mainly as veterinary dressers. The efficiency of the "vet must fight" slogan proved its worth when a veterinary unit, surrounded by the Japanese in the jungle, fought its way out—bringing many of its animal patients with it.

Here were problems of the Indian Army veterinarians. After the first Burma campaign in 1941-42 there was an outbreak of surra in horses and mules on the Assam-Burma frontiers. At one time 17% of the animals strength of the command was out of action and immobilization of the British Army was threatened. Unfortunately the animal works normally for some weeks after infection with surra before an attack is indicated thus giving it a chance to spread unhindered, and early diagnosis is difficult. The only method of detecting the disease early was to make frequent microscopic examinations of wet blood films. Control was by isolation of the infected animals. Millions of such examinations were

made in the jungles and the hills in 1942. The drug used to treat surra was German made, and supplies were very short. A British drug called antrypol was substituted, for intravenous injection, and it effected a cure in 90% of the cases.

The Veterinary Corps set up antisurra units, equipped with mobile diagnostic laboratories. By 1943 the infection had fallen from 17% to 7%, and by 1944 it claimed only 2% of the army's animals.

Many water buffalo were used for transport by the Indian army owing to the water-logged swamps during the monsoons, and these brought their train of diseases calling for operations in the field. Camels also were used on this front, and required frequent testing for the surra parasite. Bullocks had to be shod at the farriery wing of the veterinary school and often operated upon for their amazing habit of eating all before them. The ostrich's proverbial appetite has nothing on the bullock. One army bullock operated upon by Indian veterinarians in the war had a formidable array of indigestible things removed from its stomach, including nails, stones, and actual money in hard cash! He was probably the only member of the command that had money right through from one payday to the next. Mules were imported from the Argentine and trained by Royal Indian Army Service Corps handlers. They had to become used to dive bombing before they went into action, and this training was accomplished by tethering them in a field where there were some old fair-ground toy aeroplanes, swinging around and up and down on circus round-abouts, whizzed over the mules' heads and dived at them until eventually the animals learned that the toy airplanes always missed them. Then mules and ponies had to be trained for mountain warfare by leading them with their packs down steep concrete tracks, and finally down the steep tracks over which running water poured.

The Japanese Army in Siam had a large animal contingent on service. The veterinary problems did not end with the surrender of Japan in the Asian Theatre. The Japanese left many animals as well as troops scattered over all the countries they plundered. All animals fit for further work were held for use in the countries, but no animals were allowed to enter India for fear of spreading epizootic lymphangitis amongst the surplus of army animals already there. In Burma, Malay and Indo-China a lot of ex-Japanese Army animals were distributed free to the civil authorities, for use in the rehabilitation of the country, and as Siam was an ally of Japan and is therefore an ex-enemy country (these countries were on whichever side seemed to be winning at the time!), 200 riding horses, 958 pack ponies and mules found there were sold to remount the Siamese Army cavalry. A Jap racing mare found at Bangkok was also sold to the Siamese Army and should prove useful in the "get away" the principal tactic of that army.

The Japanese animal welfare was probably the worst of the countries of the war. Five hundred ten army animals, mostly pony stallions found by the British at Bangkok after the surrender, were in very poor condition. They were from the Japanese 15th, 33rd and 37th Divisions and were reported afflicted with flyblown sores and often were so useless as to be unable to rise. "Almost all transport animals had overgrown feet, dropped soles and thrush," stated a South-East Asia Colonel amongst the first to reach the Jap base. Over two-thirds of these animals had to be destroyed immediately and buried. In addition to their German-like indifference to animal suffering, the Japs lacked experience with horses, although they used large numbers to mount officers in their rapid advance into Malaya.

Colonel Gray reported that 2,154 of the 2,699 horses belonging to the Japanese 37th Division were in such bad condition they had to be destroyed following a road march of 3500 kilometres in four months. Several were drowned or killed in battle on the way, so they must have suffered upwards of an 80% loss. The 15th and 33rd Japanese Divisions were reported to have lost 5,000 animals mainly from hunger in the retreat from Kohima, and the Senior Jap veterinary officer stated that only five horses returned alive; this was a 99.9% loss.

The Japs kept their horses without bedding on undrained standing, no grooming was ever done, and head ropes were usually too tight! The only veterinary treatment reported was that they applied mercurochrome to all sores and cuts, although they had ample stocks of veterinary and farrier equipment. Bad shoeing had cut away heels and frogs, rasped the outer hoof walls and used unnecessarily high nail clinches. The British later organized two troops of a Japanese horseguard corps to care for the neglected animals. The abuse of the animals by the Japs during the war was due as much to inexperience and ignorance as to sheer neglect. That is the story with most Eastern natives who do not have Western guidance.

The Japs kept their war dogs in much better condition, and after British instruction in grooming and stable management, the condition of their horses improved considerably.

The original Japanese army horse used in Asia was usually a quiet, rough-paced pony stallion, over 15 hands, ridden by officers or N.C.O's. They also had some heavy, chestnut-colored transport horses similar to the French percheron excepting for the color. They also commandeered, in the countries they invaded, French Indo-Chinese ponies, Chinese pack ponies, light 13 hands Java and Sumatra ponies from the Dutch army, tiny, but hardy, Siamese midget ponies little more than 11 hands high, Indian ponies and Burmese ponies and the poorer types of mules.

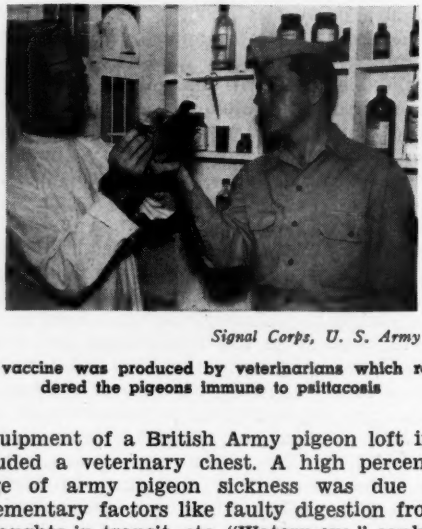
In Italy conditions for the Army veterinary corps were often very trying. The Italian campaign was a serious blow to those officers and others who scorned the idea that there was any place in modern warfare for the horse and mule. Long-eared "ornery critters" kept going when the tanks and staff cars were bogged down in mud, and many wounded were brought in to the hospitals by mule ambulance from the hills when no motor ambulance could reach them.

The veterinary officers had to deal with all sorts of animals from pigeons to elephants. Early in the war when chemists strove to find a substitute for quinine, 12,000 compounds were tested on bird malaria in canaries before the drugs mecaprine and pamquin were perfected. A special canary-breeding scheme was started by two Yorkshire canary societies and in 2½ years they bred 2,500 birds. Special rations of bird food were allowed them by the Ministry of Foods.

The worst problem, apart from the routine pigeon diseases and ailments, was a serious outbreak of psittacosis amongst pigeons on the eve of D. Day. This disease had appeared amongst pigeons in the U. S. in 1940 and it is thought that U. S. Army pigeons introduced the virus to British lofts in 1944. Detailed studies by the veterinarians produced a vaccine which rendered the pigeons immune. The danger of course was the possibility of men contracting psittacosis fever after handling the birds, but no such cases arose, despite hundreds of blood tests that were made on the birds. The old treatments were deosan, potassium permanganate and silver lotion. Later the sulpha drugs were used; but for service birds, which have to be in fit condition for abnormal flying weather, I found that it was neither worth the time nor trouble to treat them, for if cured they were still below par and hardly worth risking on a vital job, especially when we had thousands more to deal with.

Prevention was always better than cure in practical military pigeon operations, and once a bird was found to be affected with any serious diseases the best treatment was to kill and burn it and isolate all contacts. Even pigeons that recovered from psittacosis and were immune had an occasional phase when they would pass the disease organisms in their droppings and endanger the loft. Blood tests however were made from the wing vein to distinguish those which had, had the mild form of the disease and recovered. These were recommended for breeding in preference to those which had not had the disease, on the assumption that the immunity would be inherited; a doubtful assumption.

The next most alarming disease outbreak in pigeons before D-Day was pigeon pox, always feared because its very contagious nature and epidemic risk; but cures were effected by isolation and treatment with tincture of iodine on the affected parts. The standard



Signal Corps, U. S. Army

A vaccine was produced by veterinarians which rendered the pigeons immune to psittacosis

equipment of a British Army pigeon loft included a veterinary chest. A high percentage of army pigeon sickness was due to elementary factors like faulty digestion from draughts in transit, etc. "Watery eye," canker of the vent or nose and diarrhea were the commonest ailments experienced. The veterinary chests included supplies of acriflavine cream for cuts, bottles of pulverized bismuth for sour crop and indigestion, chlorodyne for diarrhea, cod liver oil capsules for general tonics, deosan for internal antiseptic use when disease was suspected, argentum opthalmic eye lotion, glucose for exhaustion, syrup of ferric phosphate as a tonic for anemia, insect powder, purgative salts, and surgical instruments for treating wounds. Almost every loftman considered himself a walking encyclopedia on the treatment of pigeons diseases, and every other pigeon officer thought himself a professor whose own experience was unrivalled!

Lead Arsenate for the Removal of Bots

A Preliminary Report

By R. D. RADELEFF, D.V.M.
Kerrville, Texas

WHILE there may be some argument as to the exact amount of damage done to the equine hosts of Gastrophilus larvae, there is little dissention to the statement that both the adult and larvae are a source of annoyance to the host, leading to unthriftiness, irregular appetite, unkempt hair coat, colics and nervousness. The presence of the adult females attempting to oviposit has brought down the wrath of many a rider and driver.

The use of carbon disulfide to remove bots is a standard procedure. Its use presents several hazards, including inhalation, if not given by stomach tube, production of colic in many instances, lodging of capsules in the esophagus and its toxicity if used on pregnant mares, young foals, the aged and the weak. Also, until unfortunate results have taught the layman better, it is difficult to get the uninitiated to actually prevent the patient's partaking of food during the period of starvation.

While attempting to remove tapeworms from several horses, using the lead arsenate developed for ruminants,[2,3,4] it was noted that copious quantities of bots passed following administration of the drug. This observation was followed up on individual animals to establish what appeared to be a safe, nontoxic effective dosage for the removal of bots, a series of routine administrations was begun.

In this series 115 horses have been treated with lead arsenate. The series includes eight foals, eight months of age or younger, 24 yearlings past and 83 two years of age or older, and including a group of 29 thoroughbred mares, 15 of which were six months or more pregnant.

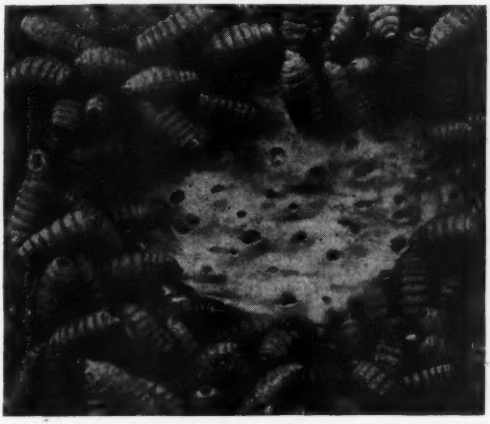
The drug was given at the rate of 0.2 gram (3 grains) per 100 pounds live weight, the dose being mixed with an individual feeding of the regular grain ration. A commercial, spray grade lead arsenate of 98% purity was used in each instance. The taste of the drug was not objectionable to the horses treated.

Observations of efficiency of action have thus far been from a clinical standpoint. In each instance numbers of bots were passed during the ensuing 48 hours; the number passed varying from 24 from a colt to 288 from an adult mare. Excellent clinical improvement followed each treatment. In the colts, still in winter coats despite July heat, immediate shedding to a summer coat occurred, together with a rapid improvement in flesh and condition.

In the older mares and geldings, clinical improvement consisted of rapid gain in weight and glossing of the coat. Improvement of appetite with greater gains in proportion to feed consumed was evident in every instance. The results were most gratifying to the clients.

Definite evaluation of lead arsenate as compared with the standard of carbon disulfide for the removal of bots has not yet been possible. This work will be undertaken as soon as clinical material for it is available. It is, however, reasonable to state on the basis of the clinical evidence presented, that lead arsenate offers promise of being of value for the removal of bots.

Aside from efficiency, the method has the advantage of ease of administration regardless of intractibility of the animal. It also eliminates the difficulties and hazards attendant upon dosing with carbon disulfide. Since in no instance were toxic effects noted in the horse, it may be assumed that lead arsenate in the prescribed dosage is safe to use.



Larvae of *Gasterophilus intestinalis in situ* on a section of stomach wall. USDA photo

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Veterinary Practice—XI

By E. T. BAKER
Moscow, Idaho

Changes in Practice

Except in rare instances, the college student is not given much information on the changes in practice. If he happens to graduate when times are prosperous, and he has all the work he can do right from the start, he is liable to think it is because of his skill and that it will continue forever and then some. Those of us who have been in general practice for 25 years or longer know better. We have learned by bitter experience how sensitive our practices are to varying economic conditions.

Without going into Grandpa's discussion of "when I was a boy," I might say I have noted a number of changes in our profession since my graduation from Ohio State in 1909.

The machine age began crowding the work horse out of the picture rapidly about 1915. Now, we think there will always be a number of horses on small farms, but their number is decreasing year by year. I shall not be surprised to see the workhorse pass in a few more years.

Fortunately, the gradual decrease in equine work was not felt seriously. After having treated thousands of sick and injured horses, I would not be sorry if I were never called to treat another one. This may sound like heresy, but it is due to the difficulties in handling equine ailments. I have worked from three to five days on a bad case of impaction, giving medicine that cost money, and still have the patient succumb. Old fashioned "lung fevers" were equally obstinate, and before the days of serums, usually died from either exhaustion or too much treatment. Handling of high class logging horses, saddle horses and ponies is much different than handling common "farm plugs."

A New Decade

In 30 years we have been through two wars, and agriculture has experienced two exceedingly prosperous "booms" and three very distinct "depressions."

Land has gone up to $600 an acre and flopped back to $50, with few purchasers. Hogs have sold, live weight, from three to 30 cents a pound. Dairy cows have fluctuated in value from $35 to $200. Sheep have been as low as $2 per head, with wool a dime a pound, up to $20 for a grade ewe, $1,000 for a purebred buck, and 45 cents a pound for wool.

During all these "ups and downs" our fees have varied little. We do not believe in a "feast today and a famine tomorrow." Hence, we live much the same year in and year out, putting away a few dollars whenever we can for the proverbial rainy day, which is to be expected even in this irrigated section.

The Financial Side

As mentioned in previous pages, practice consists of good years, average years and lean years. It costs the same to treat a patient whether one is paid for the call or not. By this token, it costs money to lose money. An example of this may be shown in our own business, for we marked off $12,000 from 1929 to 1939. It probably cost us around $3,000 to lose this, so our total loss was nearly $15,000. For this reason we advise the young practitioner to live normally but not foolishly. Keep expenses down. A dollar saved is just the same as a dollar earned out in the mud or snow, and there will be times when not very many of them are earned or leastwise collected.

Live well on good, nutritious food. A grocery bill is easier to take than one from a hospital. Buy good equipment, good clothes, and guard your health.

Do not burden yourself with too many clubs, associations or fraternal orders.

Do not try to be a big man in your community. You will be valued at your correct worth.

Carry enough life insurance for protection, as well as auto, fire and liability policies.

Pay cash for your supplies. You will be surprised how the discounts help.

Attend as many association meetings as you can, and meet men from other sections of the country and get their viewpoints. Many little tips we have gained from men at these meetings have proved valuable.

By starting to live simply when you are just beginning and have to, you will learn habits of thrift that will not leave you when you become financially independent.

Take a reasonable interest in your home town, and various activities, for one must have hobbies and friends to live a full and enjoyable life.

Don't try to impress people with the fact "I am a college man." Who cares?

What of the Future!

We can envision a new world during the next generation. When a large transport plane can leave Japan this morning and land in this country tomorrow, distance has been overcome. New diseases will enter our shores, in spite of the most rigid quarantine measures, and the graduate of this year will be confronted by entirely new problems before his hair is gray.

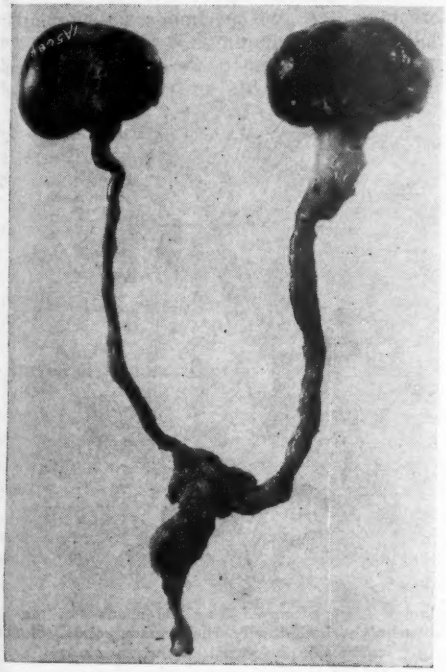
(To be continued)

Clinical Reports

Nephritis Due to Escherichia Coli Infection

History—A two-year-old female Scottie was presented for treatment October 10, 1946. The owner had noticed a dribbling of urine for the past two or three months. The dog had also shown irregularities in eating and had lost considerable weight.

Symptoms—There was an apparent swelling of the abdomen. Palpation over the region of the kidneys, elicited signs of pain. A urine sample showed undue cloudiness and some sediment. A laboratory analysis of the urine



showed a pure culture of *Escherichia coli* and it was also positive for albumin.

Treatment—Treatment was started with 20,000 units of penicillin, injected intramuscularly, three times a day for a period of four days. The dog was discharged, seemingly improved, but, for a period of nearly four months, she was brought back at about two-week intervals due to continued incontinence. Each time, the urine was positive for *Esch. coli* and albumin. Various treatments were tried; for example, mandelic acid five grains and ammonium chloride three grains, t. i. d. for five days; sulfamerazine 0.5gm, three times a day with five grains of mandelic acid; 10% silver nitrate injected into the bladder; 10cc argyrol daily for five days; 6mg stilbestrol given in two doses two days apart.

When treatment no longer seemed feasible, euthanasia was performed Feb. 20, 1947.

Autopsy—There was a diffuse suppurative degeneration of both kidneys, especially the left, with considerable proliferation of connective tissue. Abscesses were present throughout the kidney structure, being more numerous in the cortex than elsewhere. The capsule was easily stripped leaving a smooth surface. The ureters also were greatly enlarged, being more noticeable in the left one. A post-mortem diagnosis of suppurative nephritis was made.

Summary—This condition is not uncommon. The source of infection may be the blood stream, secondary to pyemic diseases, such as distemper, pneumonia, or mastitis; traumatic injuries over the region of the kidneys, reducing the local resistance or, most common, urogenous in nature, the organism spreading to the kidney from the urethra, bladder and ureters.

If only one kidney is affected, the condition may be alleviated by the surgical removal of the affected kidney.

Esch. coli is very common in nature, being a normal inhabitant of the digestive tract. It it a gram negative rod and for this reason possesses a natural tolerance for penicillin.

OLE ROLLAG

Beaver Creek, Minn.

Carcinoma in the Vulva of a Cow

December 6, 1946, a milking shorthorn cow with a discharging ulceration on the exterior part of the left lip of the vulva, was brought to us for treatment. The owner stated that the nodules began forming about a year previously and he had been removing them by pulling them off. He said there was some bleeding of the part after he had removed the nodules and they grew back in a short time after removal. During the summer, he had used "smear 62"[1] on the areas where he had removed the nodules. The ulceration began about two months previously. It began from an area from which the owner had removed one of the nodules by pulling it off.

This cow was five years of age and an exceptionally fine specimen of the milking shorthorn breed. On rectal examination, a fetus was palpated and estimated to be about four

[1] The composition of "smear 62" is: Diphenylamine (technical grade), 3.5; benzol (90% commercial), 3.5; turkey-red oil (sulfonated castor oil pH or neutral), 1.0; lampblack (Germantown), 2.0; being parts by weight.

months of age. There were approximately nine nodules around the vulva, in addition to the ulceration.

The ulceration was approximately one inch wide and two inches in length. It had a fetid, purulent discharge and the skin surrounding it was thickened considerably. The nodules exhibited a cauliflower-like appearance and were approximately one-half inch wide at the base, extending out varying distances, none more than one-half inch.

The cow was secured in a stanchion. The vulva and surrounding area were cleaned with soap and water. She was given an epidural injection of 13cc of 1% procaine. Anesthesia was obtained in the pudenda region in about eight minutes. An elliptical incision with a short diameter of about three inches, was made around the ulceration and it and the surrounding thickened skin was removed. The ulceration was very necrotic and had a foul odor. According to Runnells (Animal Pathology 3rd Edition), the action of putrefactive bacteria in filth accumulations in crevices and on the surface often produces a distinctive and offensive odor in skin carcinomas. The incision was closed with four interrupted sutures. The sutures were so placed that they drew the upper part of the right vulva lip over to the part where the incision was made on the left vulva lip. This constricted the vulva to some extent, but not enough to interfere with normal parturition. The "pocket" that was formed in the left vulva lip by the operation was packed with an antiseptic gauze pack. Two of the largest nodules were removed surgically.

The antiseptic gauze pack was removed 48 hours after the operation. The area around the vulva and anus was cleaned every day. Two ounces of a 1% colloidal iodine solution was injected into the "pocket" the third day after the operation. On the fifth day, campho-phenique was applied to the area and the packet was swabbed with campho-phenique. The stitches were removed on the seventh day and 10cc of a 2% colloidal iodine solution was injected into the incision. The sutured parts had grown together and the part had healed very well.

A section of the ulcerated tissue that was removed, examined microscopically, was diagnosed as a squamous cell carcinoma. Numerous mitotic figures were found in the tissue section. The tissue failed to show a basement membrane. Strands of stroma separated the groups of proliferation cells. There was considerable growth of epithelial tissue that had an embryonic appearance. Necrotic areas were present to a great extent in the tissue section slide. A tissue section slide was made of one of the nodules that was removed and it showed the same identical pathology as the tissue section from the ulceration.

The cow was discharged from the hospital 10 days after the operation.

CECIL W. INGMIRE

Akron, O.

Belladonna Poisoning in Pigs

The first of three recent occurrences of plant poisoning in my practice was in a herd of 60 eight-week-old pigs, in good condition. The pigs were vaccinated with hog cholera antiserum and virus, and the following day three of them died, suddenly. The next day two more died and the remaining pigs were then given therapeutic doses of swine erysipelas antiserum; acute swine erysipelas being prevalent in this area. The following day three more pigs died and specimens were taken to a laboratory for diagnosis.

The symptoms noted were: rapid respiration and pulse, widely dilated pupils, oral mucous membrane pale, temperature early in the course 105 to 106° F. dropping to 100 to 101° F. immediately preceding death. There was incoördination, and muscular tremors, which occurred three to six hours after the first symptoms were apparent, followed by paralysis before death. Necropsy findings were negative.

Solanum nigrum, one of the 1600 species of the Solanaceae-night-shade family. The common potato, *solanum tuberosum*, belongs to the same family

The laboratory diagnosis was belladonna poisoning. The rather weedy pasture on which the pigs were pastured was searched and a large amount of deadly nightshade, *Solanum*

nigrum, was found. The pigs were removed from the pasture and the deaths ceased.

The second occurrence of poisoning of this type was in a herd of 40 pigs, that had been immunized against both hog cholera and swine erysipelas. The symptoms were identical to those in the preceding case. The farmer was convinced that it was a serum break, but the weed was identified in his pasture and removal of the pigs from this pasture ended the losses.

The third occurrence was in a herd of 35 pigs in which the losses appeared to be of chronic nature. Five pigs had died over a period of a month; one or two dying each week. The symptoms were the same as noted in the previous cases and deadly nightshade was identified in the pasture. Removal of the pigs from the pasture stopped the losses.

Several cases of the belladonna poisoning

Left: Hyoscyamus niger, henbane. Right: Atropa belladonna

have been encountered in cattle, but none have been fatal. Stimulants and large doses of mineral oil was the treatment employed in such cases.

I have observed that this weed growing in other hog pastures wherein no losses have occurred. This could be due to the fact that in such places, the hogs were very well fed on a balanced ration, and did not eat the weed.

Solanum nigrum, commonly called black nightshade, deadly nightshade or poison berry, is a member of the Solanaceae nightshade or potato, *Solanum tuberosum,* family. In addition to black nightshade it includes a number of plants often responsible for poisoning in cattle, sheep and swine—*Datura stramonium* (jimson weed), *Hyoscyamus niger* (black henbane), *Nicotiana tabacum* (tobacco), *Atropa belladonna* (belladonna) and various other less poisonous and non-poisonous plants.

The poisonous principle in deadly nightshade is a glucosidal alkaloid, solanine; in jimson weed, hyoscyamine; in henbane and belladonna, hyoscyamine and in tobacco nicotine. The alkaloids occur in the green leaves and stems and in the unripe fruit, and in tobacco in the cured leaves also. Belladonna and jimson weed also contain atropine in the roots. Since the physiologic effect of poisoning by all of the plants is similar it is usually called belladonna poisoning, which perhaps as a collective term is as descriptive as any and is better understood by the stock raiser than "solanine poisoning" would be.

Muenscher* describes *Solanum nigrum* as "Annual herb, with much branched, often spreading, glabrous or hairy, angular stems, eight to 39 inches tall, leaves alternate wavy-toothed or nearly entire. Flowers in small umbel-like lateral drooping clusters; calyx of five small lobes, persistent; corolla wheel-shaped, 5-lobed, up to 1cm in diameter, white; stamens 5, fused by their antlers. Fruit a many seeded purple or black berry, 0.5 to 2cm in diameter."

These cases are of particular interest because deadly nightshade is reputed to be rare in Nebraska.

J. C. HUBBS

Syracuse, Nebr.

Testicular Tumors in a Fox Terrier

History—An aged, male fox terrier was brought to the hospital for euthanasia because of total blindness due to cataracts. The dog was in good flesh and the hair coat had a normal sheen indicating a fair degree of health.

Symptoms—On examination the testicles were found abnormal in size and conformation. One testicle was of twice normal size, round and had the appearance of a hematoma. In fact, there was only one thing normal about this testicle and that was its location in the scrotum. The other testicle was very small and was located subcutaneously just outside the external inguinal ring.

Pathology—The animal was chloroformed and on sectioning, the large testicle was found to be involved by a malignant interstitial cell tumor.[1] There was evidence of metastasis. Hemorrhage and necrosis were very conspicuous. The tumor cells resembled small interstitial cells with hyperchromatic nuclei. Mitotic figures were numerous and interstitial lipoid was demonstrated in abundance. A perithelial arrangement of the cells and papillary masses around cords of fibrous tissue were also important features.

The small testicle was atrophied due to an interstitial cell tumor[1] and showed a nodular hyperplasia, literally nests of eosinophilic cells. The nodules were embedded in the testicular substance. Multiple nodules were noted in some cases. They were uncapsulated and seemed to push the seminiferous tubules aside. They were packed together in solid cords, often with a marked perithelial arrangement. They consisted of large polygonal or

*Muenscher, Walter Conrad. Poison Plants of the United States, page 201. The Macmillan Co., New York, 1939.

round cells with abundant cytoplasm, which either showed a finely granular or eosinophilic appearance. The nuclei were small, but twin and giant nuclei were not uncommon.

After making a correlative study of the clinical and microscopic picture of this case and reference[2-3] material, it seems quite evident that the small testicle became involved through matastatic spread from the malignant interstitial tumor.

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DALE L. BIVIN

Concordia, Mo.

Fibrous Occlusion of the Cervix in a Sow

Obstetrics in any species is beset with freak occurrences to confuse the diagnostitian. That porcine obstetrics is no exception is illustrated by the following case, which was treated April 16, 1947.

This animal was a purebred Duroc sow, 10 months of age and bred to farrow for the first time on April 15th. On that day she had made a nest and labored strenuously without expelling any fluids. The following day when she was brought to the hospital she was alert, but was not straining. Digital examination revealed that the cervix was not dilated, so it was decided that the straining had not been true labor and that parturition was not imminent.

During the next two days she continued to be fairly bright (there were no temperature readings recorded) though she ate little and on several occasions went through the motions of nest making and strained quite noticeably. In fact, the straining caused a prolapse of the rectum on April eighteenth, which was replaced and held with a purse string suture. On the same day a blood sample was drawn from the ear vein. Because an infection was suspected, only a leucocyte count was made, and this not recorded. However, it was in the neighborhood of 5000 per cubic millimeter—less than one third the normal count for a pig. The following day the cervix was still constricted and she appeared very depressed, and cesarean section was decided on. The prognosis was unfavorable.

The sow was restrained in lateral recumbency on a table, the paralumbar area prepared, and chloroform anesthesia started. She went through a weak excitement stage and the pupils then began to contract slightly. Respirations, which had been slow, ceased—permanently, in spite of coramine and artificial respiration. Contraction of the pupils in a healthy pig is a pretty good indication of the stage of anesthesia, but is not to be relied on in a case of toxemia. Degenerative changes of the internal organs, especially heart and kidneys, might not have allowed surgical anesthesia to precede death. The depression of circulatory and respiratory centers by chloroform added to the already weakened condition of the heart and the impaired elimination by damaged kidneys may have left little or no margin of safety. On the other hand, close observation of respirations and heart rate might have lead to stopping of anesthesia before it was too late. Reflex stimulation of the vagi would probably have occurred earlier, had that been the cause of death.

An extensive post-mortem examination was not possible. However, the uterus was taken out and in being handled was torn in several places because of its friability and the thinness of its walls. Through the tears gushed an estimated two gallons of clear brown putrid smelling fluid. Eleven fully formed fetuses and their membranes were withdrawn from the uterus, They had undergone decomposition, their hair being easily wiped from the skin. Following down each horn to the cervix revealed that it had no lumen at all. Microsections of both cervix and uterus were made. The cervix showed many fibroblasts, fibrous tissue and few leucocytes. There was extensive sloughing of the endometrium, separation of the myometrium's fibers, with a light sprinkling of fibroblasts and leucocytes.

Three facts of the case allow for some speculation. First, according to most obstetricians, the second stage of labor, which was observed in this case, is initiated by the presence of fetal membranes or some part of the fetus in the cervix and vagina, and does not occur before—barring a vaginitis or cervicitis (a possibility, but not a probability in this case). The condition of the cervix did not allow for passage of anything. Only the smooth muscle of the uterus, and not skeletal muscle, is known to be sensitized to the action of oxytocin. But perhaps its contractions play some part in initiating the abdominal press. Stilbestrol causes uterine contractions without abdominal press, but the comparison is not entirely fair since there are other factors to be considered at parturition—*e.g.*, placental hormones. Though the apparent contradiction is interesting, it is hardly a sound basis for doubting what the majority of cases have shown to be true.

The second call for speculation is the leucopenia. Microsections did not point to a bacterial infection—though one probably pre-

ceded the fibrosis of the cervix. On the basis of bacterial infection, then, there would be no reason to expect a leucocytosis. However, it is said to be the toxic products of the bacteria—not the bacteria themselves which stimulate bone marrow to increased granulocyte production. Why wouldn't toxic products of the decomposing fetuses have the same stimulating effect? Toxins stimulate up to a certain point, but past that they destroy the marrow. It seems likely that the decomposition products of eleven fetuses over a period of two or three days would have a destructive effect.

The last point, of course, is, what caused the fibrosis of the cervix, and when did it occur? Had it occurred before breeding it is doubtful that the spermatozoa could have entered the uterus. Admittedly, a sperm is very minute. Perhaps there was an injury during coitus which made the tissues more susceptible to any bacteria present.

It is probable recovery would have followed cesarean section on the day the animal was brought to the hospital, but it is difficult, even in retrospect to find much fault with the diagnosis reached at that time on the basis of the symptoms present.

The limited value of reporting such a rarity, especially when the data is so incomplete, is obvious. But it is rather interesting, and if the knowledge that such a thing is possible leads to one correct diagnosis (without leading to an incorrect one in another case), the report is worthwhile.

MARY L. HAMMOND

Laramie, Wyo.

Lymphocytoma in a Dog

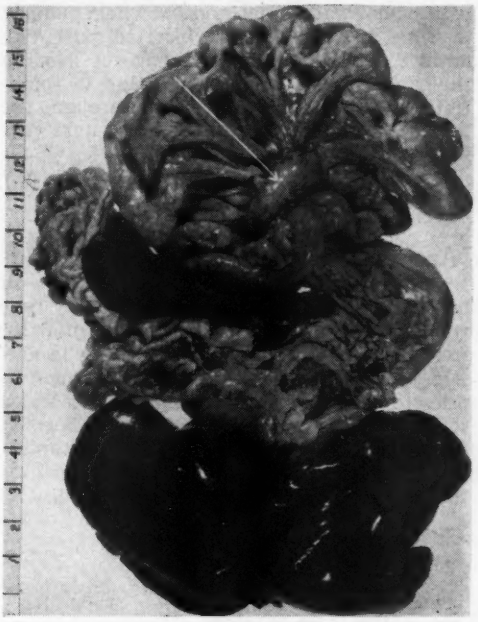
April 1, a female Chow, 25 months of age, was presented with a history of anorexia, losing weight and a rough coat, for the past 12 days. It was also noted that she had a pear shaped abdomen.

Upon palpation of the abdominal cavity, a hard mass was felt posterior to the kidneys. A provisional diagnosis of pyometra was made. She was thereupon given 8mg of stilbestrol intramuscularly, 23 grains of sulfathiazole per os. A radiograph of the abdomen was made after which a blood sample was drawn for examination. The laboratory report revealed 5,120,000 red blood cells and 18,700 white blood cells.

The X-ray photograph revealed an oval body which did not show up very distinctly.

At 10:00 p.m. of the same night and 8:00 a.m. of the next day, she was given 0.5gm of sulfathiazole per os. At 3:00 p.m. of April 2nd, 6mg of stilbestrol was given intramuscularly, another X-ray photograph was taken, after which 125cc of citrated whole blood was given intravenously. That night, she was again given 0.5gm of sulfathiazole and a vitamin preparation. The next morning, the sulfathiazole was again repeated.

At 2:00 p.m. of April 3rd another whole blood transfusion of 125cc was given as supportive treatment, since a laparotomy had



Visceral organs in a case of lymphocytoma. The white arrow points to the hard mass palpated ante mortem, and seen in the radiograph

been decided upon. A subcutaneous injection of 3/8 grain of morphine sulfate and 1/100 grain of atropine sulfate was given one-half hour before the operation. The operative site was prepared in the usual manner using tincture of metaphen as a skin antiseptic. Ether anesthesia was used to supplement the basal anesthetic.

The laparotomy revealed the "hard mass" to be an enlarged set of mesenteric lymph glands, which were hard and had a thick capsule. The diagnosis was then changed to lymphocytoma and, the owner being present, immediate euthanasia was advised.

The liver was enlarged to about three times normal size, but the spleen appeared nomal.

Feldman in "Neoplasms of Domestic Animals" states that "in many cases, the customary blood picture of leukemia is lacking." This might lead one to believe that the above case was an aleukemic lymphocytoma.

SEYMOUR ROOK

Brooklyn, N. Y.

Brighter Outlook

We are coming through a season of new corn downers in the cattle in somewhat the best morale of our career. For the first time, we are saving many of the pitiful paralyzed creatures—by a very "corny" treament. It is two or more quarts of kerosene and about the same of mineral oil stirred into two big pails of hot water, the fragrant whole pumped in with a stomach tube inserted part way down the esophagus, in the hope of flooding the rumen. The straight kerosene is sometimes placed into the rumen through the flank. We look forward to this work next year with less of glumness.

J. H. WINTER

Brooklyn, Mich.

Amputation of Forelimb of a Dog

History—December 7, 1946, a male dog of no particular breeding, approximately one year of age was admitted to the hospital for treatment. The owner reported that the animal had been struck by a car two months prior to that date and that he had attempted to treat the animal with home remedies.

Symptoms—The animal could not use the right foreleg. This dysfunction had caused the anterior portion of the foot to become

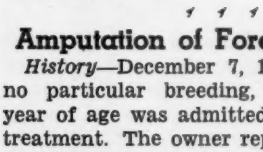


Fig. 1
Dysfunction of the leg was responsible for dragging of the foot which caused traumatism

flattened dorso-ventrally and considerable traumatism had been self-inflicted by the dragging of the foot. The elbow had dropped below the normal position with complete ankylosis and there was extensive muscular atrophy of the shoulder muscles (Fig. 1).

Diagnosis—Brachial paralysis, ankylosis of the elbow joint and extreme atrophy of the muscles of the shoulder and the arm.

Treatment—Surgical removal of the limb was decided upon and accomplished in the following manner. An area was shaved from the elbow to the shoulder and an extensive area on the thoracic wall also was shaved. The area was painted with tincture of iodine and then alcoholic sublimate packs were applied for several minutes. The animal was anesthestized with ether anesthesia. An elliptical incision was made on the medial side of the leg starting at about the elbow and ending at about the same height on the anterior side of the leg. The flap of skin thus formed was retracted and the muscles were separated from the medial aspect of the leg, exposing the brachial artery, vein and nerves. A ligature was placed around the group of structures and they were divided distal to the ligature. The operation was continued by separating the insertion of the muscles on the anterior side of the humerus, controlling hemorrhage as it occurred. Next an elliptical incision corresponding to the medial incision was made laterally, and the insertion of the deltoideus and scapular muscles from the proximal end of the humerus was divided. The scapulohumeral articulation was disarticulated by severing the capsular ligament

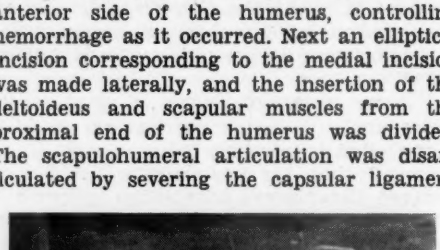


Fig. 2. After amputation

and the origin of the biceps brachii. The leg was then free from the body. After the hemorrhage was controlled the muscles were arranged and the two flaps of skin were sutured together with mattress sutures. The area was covered with sulfanilamide and a pressure pack was applied and area thoroughly bandaged. The bandage was removed in 48 hours, the wound examined and another bandage applied. The sutures were removed in six days and the animal was sent home (Fig. 2).

Dogs not required for work, particularly small dogs and dogs of medium size get about very well after amputation of a non-functioning limb. While the operation may be performed at any time the animal is in condition to stand a major operation, the shock is less and the safety factor greater after atrophy and a decrease in the circulation has taken place, as in this case.

ANSEL B. TARRANT

Clarinda, Ia.

Loss of Mink Due to Poor Vaccination

October 8, 1946, 1400 mink on a New Jersey mink farm received their first injection of distemper vaccine, and October 15 the second. Both injections were given by a local veterinarian. Distemper had been diagnosed on the premises before the first injection was made. Serious trouble developed immediately after the second injection of vaccine and I was called into the case. I found:

1. Of the 1400 mink vaccinated 900 had developed abscesses and 300 had died.
2. The ranch was in heavy woods on a hillside where the air circulation was poor and the ground always wet.
3. The pens and nest boxes were not of the best and accumulated manure was present in many. The feed boards had one to two weeks' accumulation of fish bone on them.
4. Many of the abscesses had been lanced by the veterinarian and these animals had all survived. Four cultures were made of four different abscesses and sent to Fromm Laboratories for identification.
5. Approximately eight cases of distemper were observed.
6. A bottle of the vaccine had been sent to the New Jersey State Bacteriologist and found to be bacteriologically sterile.
7. The alcohol used for disinfection at the site of vaccination was 70% wood alcohol.

The following recommendations were made:

1. Clean up of the premises promptly, particularly remove all manure and spoiled feed from the pens.
2. Use a 70% grain alcohol as a skin disinfectant.
3. Remove and isolate the mink showing distemper symptoms—crusts on the nose and eyes and on the feet, general emaciation and dandruff over the entire body a result of hyperthermia.
4. Clean up the feed mixing house thoroughly. Change the feed schedule.
5. Use sulphathiazole in the feed for systemic action when the abscesses are opened.

Conclusion

Losses on this ranch were not due to the vaccine as it was found to be free of pathogenic bacteria, but were due to poor vaccination technic on the veterinarian's part and the filth conditions present. The collection of pure cultures of *Escherichia coli* from lanced abscesses confirms this. Such filth conditions made these mink poor vaccination risks. The same lots of vaccine used by this fur farmer had been given to 7000 other mink on various ranches without untoward effect.

T. T. CHADDOCK

Grafton, Wis.

Feminizing Testicular Tumor

A brief report for the young practitioner:

Subject.—Part Wirehair Fox Terrier, age 14 years.

History.—For five years the animal had been ridden by every male dog in the neighborhood. In addition, there was a decided celebacy characterized by a complete indifference to bitches in well advanced season. Said bitches were quite vigorously inviting, but this had no effect on the animal under discussion. Treatment by several veterinarians using male and female hormones had no beneficial effect.

Examination revealed a well marked tumor formation in the right testicle. The left testicle was atrophied to great extent. Nipples were of the size of those of a female that had nursed several litters of puppies. An effort was made to get possession of the dog for semi-castration and subsequent observation, but the owner decided on euthanasia and burial at home.

An enlightening report was found in the June number of the *Journal of Clinical Endocrinology*, page 438. Said report was given by Erling Ostergaard, Surgical Department, Viborg County Hospital, Copenhagen, Denmark. This case involved a farm hand 28 years of age, who developed the breast contours of a young girl and glands well developed. Following semi-castration the mammary glands gradually receded. Two years later the subject married and is now the father of a child.

The tumor is described as "presumably aberrant adreno-cortical tumor." No reference can be found in veterinary literature to similar cases, and references in medical works thus far have failed to reveal any comparable occurrences.

O. E. MCKIM

Port Chester, New York

An extreme case of verrucosis. It was the only case in the herd, and was not treated except with home remedies which were of no avail.—*Dr. P. J. South*, Melfort, Saskatchewan, Canada

Abstracts

Use of Penicillin in Leptospirosis

The newer term leptospirosis is probably preferable to Weil's disease because the latter suggests infectious (spirochetal) jaundice, which does not occur in all patients with this disease. The management and treatment of leptospirosis is discussed in the light of experience with 61 patients, 44 of whom received only general treatment.[45]

The last six patients in this series were given penicillin beginning on the first day of illness (intramuscular injections of 15,000 units of sodium penicillin every three hours for 32 to 53 doses), and it is definitely felt that penicillin modified the course of the disease. None of the patients who received penicillin became severely ill, and their hospital stay was comparable to that of mildly ill patients who received no special treatment.

Three severely ill patients improved promptly after receiving transfusion of whole blood from donors who had previously had leptospirosis. One patient received three whole blood transfusions from donors who had not previously had the disease, and slow but progressive improvement was obtained after each transfusion. Sulfathiazole in eight patients and sulfadiazine in one patient gave no apparent benefit.

Patients with leptospirosis need good nursing care under close observation by the physician. Parenteral fluids were required in 12% of this series, analgesics in 65%, enemas or other measures to combat constipation in 36%, treatment for nose-bleed in 33%. All patients received 2mg of oral vitamin K per day, and were given 10mg daily by injection if jaundice or bleeding occurred. Because anemia is almost always present in these patients, ferrous sulfate and liver extract were given orally. Large doses of multivitamin capsules were provided because of poor food intake and great weight loss which averaged 10.8 pounds in this series. A diet high in calories, carbohydrate, and protein was used to protect the liver and to build up the tissues. Tablets of methenamine and sodium biphosphate (10 grains every eight hours) were given throughout the hospital stay and one week thereafter because the kidneys are potentially damaged and because the Leptospira does poorly in an acid urine. Treatment for the eyes was seldom needed during the acute phase of leptospirosis, but 20 to 25% later required treatment for ocular complications such as iritis, iridocyclitis, and uveitis.—J. L. D.

[45] Patterson, H. M. Weil's disease; observations in 61 cases with special reference to the use of penicillin in six cases. *J. Am. Med. Assn.*, 134, pp. 1077-1080. (July 26), 1947.

Fertility of Spermatozoa Indicated by Motility

To discover a method[48] for differentiating between normal and pathological semen, 104 samples were studied to determine density, sperm metabolism, morphology, motility, lactic acid and CO_2 production, consumption of reducing substances, etc. Of all the factors studied only motility was correlated with fertility. Of 27 fertile and 11 probably fertile men only one produced semen with more than 40% immotile spermatozoa, but of 66 men probably sterile the semen of 26 contained 40% or more of immotile spermatozoa. The author's figures disprove the statement of Moench (1931) that semen containing a proportion of 25% of spermatozoa having abnormal heads is indicative of "clinical sterility." The lack of any correlation between metabolic activity and morphology of spermatozoa is confirmed.

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Control of Coccidiosis in Chicks

In Canada the Dominion Department of Agriculture sponsors[46] three plans for the control of cecal coccidiosis in chicks.

Plan 1 relies on dryness and cleanliness of the environment to keep down the number of oocysts and thus enable the chicks to attain immunity and safety. It is for farms where only one to three batches of chicks are raised per year.

Plan 2 is for larger plants where battery brooders or a very dry brooder floor is used and where coccidiosis is expected in the highly susceptible chicks when, at three weeks of age or older, they are placed in the infected houses where they are to be raised.

Under this plan the poultryman is instructed to watch for the first symptoms of coccidiosis (bloody droppings) and to treat the birds immediately such symptoms are noted. The treatment consists in giving each bird three or four weeks of age, 80 milligrams of sulfamethazine or sulfamerazine daily in the feed. This amounts to one ounce per 15 pounds of mash or one pound to 240 pounds of mash. Or the sodium salts of these drugs may be given in the drinking water; one ounce to 15 quarts or a pound to 240 quarts of water. This medication is continued for three days.

Plan 3 is utilized in plants where large groups of broilers are raised in rapid succession, and where cecal coccidiosis is a particularly serious hazard and often results in con-

[46] Swales, W. E. New method of controlling cecal coccidiosis in chicks. *Canadian J. Comp. Med. & Vet. Sci.*, 11:1, pp. 5-10. 1947.

[48] Westgren, A. Metabolism and sterility of human spermatozoa. *Acta Physiologica Scandinavica*, 12:39. 1946. Abst. *Excerpta Medica*, 1:1. 1947.

siderable loss where Plan 2 is employed. In such flocks the chicks are given a massive infection at a definite time rather than waiting for the disease to appear naturally.

Poultry plants operating under Plan 3 maintain a pen or pens known to be heavily contaminated by birds recovering from an attack of coccidiosis. Chicks, two to four weeks of age, are exposed in these infection pens for six days and at the same time given small doses of the sulfa drugs. The average dosage being

Sub-acute coccidiosis in a four-week-old Single Comb White Leghorn chick. Note the unthriftiness, stunted growth, sleepiness and emaciation

one ounce of sulfamethazine or sulfamerazine to 40 to 60 pounds of starter mash, or one ounce of the sodium salt of either drug to nine gallons of drinking water. Because the varying amount of feed and water consumed by chicks of different ages, breeds and vigor, it is safer to supply one ounce of the drug in the feed or drink per 850 to 1000 chicks per day. The object being to get each chick to consume from 30 to 40mg of sulfamethazine, or sulfamerazine or the sodium salt of either, daily.

After the six-day exposure period the chicks are moved to clean quarters and the medication discontinued. From then on till marketed they must be raised under sanitary conditions, for they will retain their immunity to *Eimeria tenella* but they are not immune to *E. necatrix* and if housed on wet floors they may suffer from a severe form of intestinal coccidiosis.

In the author's opinion the success of the plan depends much upon the interest taken in it by veterinarians, who should be relied upon to supply the poultryman with the drugs and give him directions for their use. When Plan 2 is employed the veterinarian should instruct the poultry raiser carefully on how to recognize the first symptoms of coccidiosis and when to begin treatment. Plan 3 should be employed only under the supervision of a veterinarian.

Cause of Equine Infectious Abortion Questioned

Henning[50] questions the widely accepted theory that *Salmonella abortivoequina* is a cause of abortion in mares. In two outbreaks of equine infections he was able to isolate *S. abortivoequina* from only a part of the fetuses and afterbirths, but was able to produce abortion in mares fed minced fetal organs; both those infected with *S. abortivoequina* and those free of such infection. The disease was communicated by intravenous injection of a filtrate of the organs.

Henning is of the opinion that a filtrable virus is the true cause of infectious abortion in mares and the Salmonella is a saprophyte which invades the tissues when their resistance is lowered. He also suggests that the etiological significance of Salmonella in calf paratyphoid and in fowl typhoid should be investigated further.

Toxicity of Sulfonamides for Chicks

Because the Dominion Department of Agriculture of Canada was sponsoring the Swale plans for the control of coccidiosis of young chicks by giving the birds either therapeutic or prophylactic doses of sulfamethazine or sulfamerazine or the sodium salts of either, Frank[47] of the animal pathology division of the Department conducted extensive experiments to determine the toxicity of these sulfa drugs for chicks.

Reporting first on sodium sulfamethazine Frank's investigations showed: (1) the drug given in the feed at 0.22% for six days (the prophylactic treatment) or at 0.44% for three days (the therapy) did not retard the growth of the chicks or have other deleterious effect. When fed at the lower rate for 24 days the growth rate was not affected. Given at the rate of 0.5 to 1% of the feed from six to 12 days the growth of the birds was significantly retarded, but increased growth immediately following cessation of the medication made up for the retardation rapidly.

The author concludes that no harmful effect to chicks should result from giving sodium sulfamethazine in the dosage recommended by Swales.

[47] Frank, J. F. The toxic effects of coccidiostatic sulfonamides in chickens. *Canadian J. Comp. Med & Vet. Sci.*, 11:8, pp. 225-234. 1947.

[50] Henning, M. W. On the etiology of epizootic or infectious equine abortion. *Onderstepoort J. of Vet. Sci.*, 21, pp. 17-40. 1946.

Book Reviews

Artificial Insemination of Domestic Animals. By *V. K. Milonor* and *D. V. Smirnov*-Ugryumov, Osemenenie sel'skokhozyaistvennykh zhivotnykh. 100 pages. Moscow. 1944. Printed in Russian. The following is reprinted from *The Veterinary Bulletin*, July, 1947, for the information it contains on Russian methods of artificial insemination which it contains.

The good results obtained in the improvement of livestock in the U.S.S.R. by selection and inbreeding are briefly discussed. The possible danger of such a policy is pointed out and illustrated by the case of the Mazoev breed of sheep, which was noted for length of wool. Over concentration on this good quality resulted in the skin becoming too thin for manufacturing processes and it was necessary to introduce an outcross.

The advantages of artificial insemination are that the health and fertility of the bulls are under constant observation and that each sires a greater number of progeny. It is claimed that 10 to 15 cows and 20 to 30 ewes may be inseminated by one ejaculate.

Cross breeding is of value for some purposes and is permitted on certain collective farms. Since April, 1943, natural mating with approved sires has been permitted on some collective farms, but in others sires are reserved solely for artificial insemination.

Where natural mating is in use the bulls run with the cows on alternate days. Where there is tuberculosis, trichomoniasis, brucellosis or infectious vaginitis, natural mating is not permitted.

Experimentally it was shown that within 15 to 40 days an inadequate diet affected the semen for a whole month before use, therefore, donors have a carefully regulated diet. Their condition should be well above the average: rams, in particular, should be slightly on the fat side, as during semen collection they often lose weight. If more than two collections of semen are obtained daily, diet should be increased 10 to 20%. In the case of the ram, a very concentrated diet is suggested, comprising large quantities of proteins and vitamins and even including milk and raw eggs (up to six per day). A fortnight before semen collection the ram is placed on a normal diet.

Particular attention is paid to the management of the bulls and diet, exercise and work are carefully regulated. Thorough grooming, including occasional washing, is insisted upon. These bulls are sometimes used for light farm work, such as plowing or carting light loads; this is particularly beneficial if the animals are inclined to get fat. If fat animals tend to get lazy, compulsory exercise is enforced.

Temperament and the sexual reflexes of each individual are taken into consideration, and it is emphasized that quiet but firm handling of the bull is essential; any tendency to wild behavior should be corrected at the start. It is even suggested that when the donor is led away after semen collection, some tasty food should be allowed, so that he associates reward with service. Beating or rough handling, particularly before semen collection, is prohibited.

Special care of the females to be inseminated is also taken, with great attention being paid to the diet, particularly its vitamin content. All animals, whether to be used as donors or recipients, are examined beforehand to exclude infection.

For collection of semen the artificial vagina is used and the usual precautions as to cleanliness, etc., are emphasized. Particular attention is paid to the examination of each quantity of semen collected, as the age, health, diet, time of year and the number of collections made can all alter the quality of each ejaculate; motility of the sperm is taken as the best index of fertility. Field and laboratory examinations are recommended.

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49.

For storage and transport of semen to be used immediately or within three hours, no special precautions are necessary unless the weather is cold, when it must be protected from sudden falls of temperature. If the semen is to be used after a longer interval, cooling is adopted as the best method of preservation. The ejaculates of bulls, rams and goats are generally stored undiluted; in the case of the boar a special diluent is added.

The artificial insemination centre is managed by three persons. Great care is taken to investigate the heredity of all donors.

The book is very detailed and includes considerable physiological data, one chapter being devoted to the physiology of reproduction and including several diagrams and illustrations of the female genitalia of the various species.

Bulletin

Some Parasites of Oregon Wild Life.—A list of the important parasites of Oregon fish, wild birds, deer and miscellaneous wild animals collected during the period 1926-1945 is given in this bulletin together with the name of the host and in many instances the effect of the parasitism and the environmental conditions affecting its occurrence. Thirteen illustrations are included in the text. Tech. Bul. 11, Oregon State College, Corvallis.